

FY 2005

NSTC Course Catalogue

April 1, 2004

Memo to NASA Safety Training Center Students

The NASA Safety Training Center (NSTC) was established in May 1991 by NASA Headquarters Safety and Risk Management Division to provide up-to-date, high quality, NASA-specific safety training on location to NASA Centers, or simultaneously to multiple Centers over the Video Teleconferencing System (ViTS). Since that time, this team has been actively developing and presenting courses to meet NASA needs.

I am eager to continue to meet your safety training needs in the most cost effective manner possible. As our customer, your expectations are important in defining our future and training capabilities. Please let us know if there are training needs that we are not adequately meeting or any modification we can make to better serve your needs. Likewise, reinforce us when we are properly meeting your requirements.

Our desire at the NSTC is to forge and continue a strong, lasting working relationship with all NASA Centers whereby we can help fulfill your safety training needs to assist you in the pursuit of the ultimate goal of safe operations for NASA.

This catalogue introduces the NSTC staff, the course scheduling policies, and initial listing of courses and course descriptions. Please review this catalogue with specific attention to Training Administration requirements, pages 7 and 8 and contact your local Center NSTC points of contact (POCs) to schedule classes (see page 11). Any general questions about the NSTC or specific questions concerning our courses can be addressed directly to the NSTC to either Larry Gregg, at (281) 244-1278 (e-mail – larry.gregg1@jsc.nasa.gov) or Margie Williams at (281) 244-5105, or my action officer Jonathan B. Mullin at (202) 358-0589.

Dr. Michael G. Stamatelatos, Director
Safety and Assurance Requirements

Contents

Memo to NASA Safety Training Center Students.....	2
The NASA Safety Training Center (NSTC) Staff.....	6
Training Administration	8
Course Advertisement.....	9
Course Recognition.....	10
Contact Information.....	11
Center Training Coordinators	12
Courses and Training	13
Course Descriptions	14
Fire Safety.....	15
NSTC 207, Fire Protection Theory and Practice	15
NSTC 217, Life Safety Code.....	15
Occupational/Industrial Health and Safety	16
NSTC 051, Explosive Safety Management & Engineering	16
NSTC 009, Refresher Course for Explosives Handlers and Operational Personnel	17
NSTC 010, Explosive Safety Program Management	17
NSTC 028, Crane Operations and Rigging Safety Refresher.....	17
NSTC 030, Aerial Platform	18
NSTC 036, Battery Safety.....	18
NSTC 200, Construction Safety and Health.....	19
NSTC 201, Construction Safety and Health Overview	19
NSTC 204, Machinery and Machine Guarding.....	20
NSTC 205, Overhead Cranes and Material Handling	21
NSTC 208, Mobile Crane Safety	21
NSTC 209, Forklift Safety.....	22
NSTC 210, Forklift Safety Refresher	22
NSTC 224, Laboratory Safety and Health.....	23
NSTC 225, Occupational Ergonomics.....	23
NSTC 309, Electrical Safety Standards.....	24
NSTC 310, Electrical Safety Refresher	24
NSTC 311, Fall Protection.....	25
NSTC 044, Fall Protection Refresher	25
NSTC 312, Scaffolding Safety	26
NSTC 316, Scaffold User's Seminar.....	26
NSTC 313, Cryogenics Safety.....	27
NSTC 314, Liquid Nitrogen Handlers' Course.....	27
NSTC 315, Safety in High Pressure Systems	28
NSTC 317, Safety in High Pressure Operations.....	28
NSTC 056, Flexible Hose Safety.....	29
NSTC 0318, Compressed Gas Trailer Safety	29
NSTC 0319, Compressed Gas Cylinder Safety	30
NSTC 037, Hydrogen Safety	30
NSTC 054, Safety in Hydrogen System Operations.....	31

Contents

(Continued)

NSTC 054A, Hydrogen Safety Operations.....	31
NSTC 055, Hypergol Systems: Design, Buildup and Operations	32
NSTC 047, OSHA Record Keeping Seminar	30
NSTC 040, Hypergol Safety	32
NSTC 052, Fire Hazards in Oxygen Systems.....	32
NSTC 053, Oxygen Systems: Operations and Maintenance.....	33
NSTC 047, OSHA Record Keeping Seminar	33
NSTC 501, General Industry Safety and Health.....	34
NSTC 806, Confined Space.....	34
NSTC 814, Lockout/Tagout.....	35
NSTC 039, Establishing, Maintaining, and Assessing OSHA VPP-Compliant Safety And Health Programs	35
NSTC 057, Hand and Power Tool Seminar.....	36
NSTC 058, Fall Protection for Construction	36
NSTC 045, Excavation and Trenching Safety.....	37
NSTC 059, Safety of Mobile Cranes, Derricks, Hoists, Elevators, and Conveyors in Construction.....	37
NSTC 060, Steel Erection.....	38
NSTC 061, Signs, Signals, and Barricades Seminar	38
NSTC 062, Occupational Health and Environmental Controls Seminar.....	39
NSTC 063, Material Handling, Storage, Use, and Disposal.....	39
NSTC 064, Welding and Cutting.....	40
NSTC 065, Stairway and Ladders Seminar	40
NSTC 066, General Safety and Health Provisions Seminar.....	41
NSTC 067, Personal Protective and Life Saving Equipment Seminar	41
NSTC 068, Demolition Seminar	42
NSTC 069, Concrete and Masonry Seminar.....	42
NSTC 070, Fire Protection and Prevention in Construction	43
NSTC 071, Underground Construction, Caissons, and Cofferdams	43
NSTC 072, Motor Vehicles, Mechanized Equipment, and Rollover Protective Structures and Overhead Protection	44
NSTC 073, Toxic and Hazardous Substances Seminar (Asbestos and Cadmium) ...	44
NSTC 075, Power Transmission and Distribution Seminar	45
Safety Engineering Courses	46
NSTC 001, Facility System Safety	46
NSTC 002, System Safety Fundamentals.....	47
NSTC 008, System Safety Workshop.....	47
NSTC 011, Payload Safety Review and Analysis	48
NSTC 016, Payload Safety Review Process and Requirements.....	48
NSTC 015, System Safety Special Subjects	49
NSTC 043, System Safety Seminar	49
NSTC 048, System Safety for Managers.....	50
NSTC 020, Basic System Safety Practice.....	50

Contents

(Continued)

NSTC 021, Advanced System Safety Practice	51
NSTC 022, Reviewing and Perfecting System Safety Analysis	52
NSTC 023, System Safety in Acquisition	53
NSTC 025, Software System Safety	53
Special Programs	54
NSTC 003, Certified Safety Professional (CSP) Fundamentals	
Examination Study Course	54
NSTC 006, MORT-Based Mishap Investigation	54
NSTC 012, Human Factors in Mishap Investigation	55
NSTC 014, MORT-Based Mishap Investigation Refresher	55
NSTC 017, Design for Availability	56
NSTC 018, Space Shuttle Crash Investigation	56
NSTC 019, Aircraft Mishap Investigation	57
NSTC 024, Mishap Investigation Board Chairperson	57
NSTC 026, Control Team/Crew Resource Management	58
NSTC 027, Space Shuttle Crash Investigation Overview	58
NSTC 029, Control Team/Crew Resource Management Seminar	59
NSTC 034, Situational Awareness	59
NSTC 032, Situational Awareness Seminar	60
NSTC 035, MORT Principles and Practices	60
NSTC 049, Root Cause Analysis	61
NSTC 074, Range Safety Orientation	61
NSTC 400, Certified Quality Engineer	62
NSTC 401, Certified Reliability Engineer	62
NSTC 402, Certified Quality Technician	63
NSTC 828, Process Safety Management and the HAZOP Methodology	63
NSTC 850, Basic First Aid	64
NSTC 851, Adult CPR	64
New Courses for FY 2005	65
NSTC 075, NASA Range Safety Analysis	65
NSTC 026P, Aircrew Resource Management	65
NSTC 026M, Maintenance Crew Resource Management	66
NSTC 004, Mishap Investigation Orientation and Root Cause Analysis Overview	66
NSTC 077, Hazardous Locations	67
NSTC 078, Space Safety Overview	68
NSTC 076, Electrostatic Discharge (ESD) Control	69
NSTC 080, Hazardous Waste and Emergency Response Incident Commander	
Refresher Training	70
NSTC 081, Hazardous Waste and Emergency Response Incident Commander	
Training	72
NSTC 082, Basic Explosives Safety	73
Potential Courses for FY 2005	74
NSTC 079, Space Safety Analysis	74

Contents

(Continued)

NSTC 083, Human Factors/Ergonomics Engineering and Design	75
---	----

NSTC 084, Hazardous Waste Management	75
NSTC 085, Hazardous Waste Management Refresher	76

The NASA Safety Training Center (NSTC) Staff

The NSTC has assembled a staff of technical training personnel dedicated to providing quality safety training to our customers. Our goals include providing NASA Center-specific safety training, optimizing resources (training and travel funds, student time expended, etc.), monitoring and collecting NASA-wide safety training needs, and monitoring advances in state-of-the-art safety training policies, procedures, and equipment. The administrative staff provides support to the instructor staff and to you, our NASA customers. We encourage you to call whenever questions arise concerning safety training.

Our philosophy is to provide a small, full-time administrative and instructional staff and to primarily use working engineers and other safety professionals on a collateral basis to develop and present courses. This ensures that, whenever possible, courses are instructed by those whose jobs include day-to-day activities involving the subjects they instruct. The administrative staff handles course scheduling and advertisement and provides support in the course preparation and acquisition of course materials.

Our instructor staff is highly qualified and enthusiastic about developing and presenting the type and quality of safety training needed to provide the knowledge required to perform your increasingly more complex and varied duties and responsibilities safely. The NSTC staff consists of:

Larry Gregg, CSP, Project Lead/Lead Instructor/Developer, is responsible for the supervision and direction of the NSTC staff and its overall operation. He is the key interface between NSTC project support staff and NSTC collateral, consultant, and staff instructors. He develops and manages the course catalogue; annual course needs survey, and annual course schedule. He manages overall course delivery funded by NASA HQ Code F and development activities for RTOP funded courses. He serves as a course manager for many courses and provides counseling on development and instructional techniques to all instructors. Mr. Gregg has developed and instructed numerous courses for the NSTC and assisted in development, revision, and presentation of many others. His primary areas of expertise include System Safety and MORT-Based Mishap Investigation. He holds a B.S. degree in Chemical Engineering from Oklahoma State University, and an M.B.A. in Management from Golden Gate University. Mr. Gregg has been with the NSTC since its inception in 1991 following a 20-year career as an Air Force officer with tours of duty including missile launch operations and systems development and acquisition for Air Force advanced missile and space systems. He has been awarded the Silver Snoopy for his NASA training activities and was selected by the System Safety Society as Educator of the Year for 1997.

Tim Evans is a full-time, staff instructor/developer for the NSTC. He has 25 years experience in industry on a variety of safety and quality assignments, most including full- or part-time training responsibilities. He has been supporting the NSTC since 1999 as a full-time instructor/developer. Course expertise includes Scaffolding Safety, Fall Protection, Machine Guarding, Forklift Safety, Overhead Crane Safety, Lockout/Tagout, Confined Space, Occupational Safety, Construction and General Industry Safety and Health.

Tom Torpey is a full-time, staff instructor/developer for the NSTC. Tom has a B.S. Degree in Industrial Administration and an M.S. Degree in Aeronautical Science. He spent 22 years in the US Air Force as a crewmember, aircraft commander, and instructor pilot and has 3000 hours of flying time. He has extensive teaching experience in aviation related areas and human factors training. In his career as an instructor, he has delivered training to over 4,000 individuals in a wide variety of disciplines. He is also an adjunct instructor with Embry Riddle Aeronautical University. He has been a part-time instructor for the NSTC since 1995, and joined the staff as a full-time instructor/developer in 2001. His course expertise currently includes Root Cause Analysis, Aircraft Mishap Investigation, Human Factors in Mishap Investigation, Situational Awareness, Crew Resource Management, and Space Shuttle Crash Investigation.

Marganette (Margie) Williams is the administrative lead for both the NSTC and also the JSC Safety Learning Center. She is the key administrative support person in the NSTC. She provides administrative leadership to the remainder of the NSTC administrative staff and technical support for all NSTC instructors. She additionally serves as an NSTC instructor for courses such as First Aid and Adult CPR.

Pamela Watson and Polly Caison, the NSTC Administrative Staff, provide support in the areas of course typing and logistics, student enrollment, maintenance of student training records, as well as handling follow-up course coordination, rosters, and course recognition documentation. They coordinate marketing and scheduling activities for their assigned courses/instructors, and follow up on all the details regarding these courses. Our office relies on them to provide an environment conducive to facilitating safety learning and programs and for quality customer communication.

Training Administration

Individual course scheduling and enrollment is accomplished through the Center Training Coordinators listed on page 11. Individuals interested in attending courses should contact their Center Training Coordinator.

These Center Training Coordinators are responsible for requesting courses from the NSTC, either on a course-by-course basis for special needs or by completing the annual training needs survey. Training courses are scheduled for the entire fiscal year in August based on NSTC budget considerations, center responses to the annual course needs survey, instructor schedules, and course development requirements.

Whenever possible, we try to schedule courses back-to-back during the same week or two consecutive weeks at a center or two courses presented simultaneously in an a.m./p.m. format (or the same course presented twice one week in an a.m./p.m. format). This allows economies of cost for course presentations and also may allow us to present courses economically with smaller numbers of students. With shift-type workers, the a.m./p.m. format for the same course may allow the flexibility they need to attend. If any of these options are attractive to you, please feel free to contact us with your proposals.

After the initial course presentation schedule for the fiscal year is established, courses are canceled/added based on student enrollment, instructor needs, and center needs and requests throughout the year. Typically, we need at least one month of lead-time to add a course to the schedule, although a more rapid response may be possible to support urgent requirements. This lead-time is required to make travel arrangements on a cost-effective basis, and also to meet reproduction, shipping, and other administrative timelines. We also prefer at least one month notice if the center needs to reschedule a course. We will normally provide this much lead-time as well if we need to reschedule due to NSTC needs.

In order to properly conduct a course, we will require the Center Training Coordinator to provide the following:

1. A classroom with a seating capacity needed to accommodate class size, including allowances for students to split up into smaller groups for group exercises. Please coordinate scheduled course dates with your Human Resources office well in advance to verify room availability at your Center. We prefer to have the same classroom for all days of a multi-day course.
2. An overhead projector and screen and/or a computer/computer projector.
3. A 1/2" VCR and television monitor.
4. Whiteboards, blackboards, and/or flip charts.
5. A shipping destination address.

6. Note: Many of our courses are being converted for presentation using a multimedia projector attached directly to a computer. While we have a certain number of these projectors at the NSTC, it would be preferable if one were made available at the centers. NSTC personnel will check on this availability as the class delivery date approaches. We greatly appreciate your efforts in providing this equipment to assist in course delivery.

We will contact the center no later than 4 weeks before the course is scheduled to verify schedule and need. At this time, we will make our first decision as to whether the class will continue as scheduled, be rescheduled, or be canceled. If there are a reasonable number of students enrolled or if the Center Training Coordinator is confident that the total will reach approximately 15-20 students, we will send the student materials to reproductive services. If not, the course may be rescheduled or canceled based on discussions between the NSTC management staff and the center point of contact(s). We will review the number of students registered for the course approximately 1 week prior to the scheduled course delivery date. If at least 15-20 students are not enrolled or expected, we reserve the right to cancel or reschedule the course. This decision will be made in consultation with the Center Training Coordinator, but the final decision will be made by NSTC management. In some special cases (small centers like WFF, WSTF, SSC; immediate, high-priority needs; special requests, etc.) we may deliver classes for fewer students. To support these decision dates, please begin to advertise the class early at your center so we can get a good idea about the class enrollment in time to prevent unnecessary expenditure of our limited resources.

If for any reason the course **must** be canceled or rescheduled due to center needs and circumstances, notification should be given at least one week in advance to prevent our shipping of materials. All scheduling or cancellation needs should be directed to Larry Gregg, Margie Williams, or one of the other NSTC full-time administrative staff members.

A note about contractor attendance at NSTC classes: In accordance with NASA Policy Directive 3410.2D, "Employee and Organizational Development", NASA contractor personnel may attend NASA training, provided that no Government trainees are displaced and training has been authorized, scheduled, and is necessary for Government purposes. Please keep these requirements in mind when scheduling classes and signing up students.

Course Advertisement

The NSTC administrative staff will coordinate course advertisement and marketing needs with you following course scheduling. They will negotiate with you the most effective means and methods to use, and can give you ideas on how to advertise the course(s) requested. They can provide detailed course information, brochures detailing course

content and instructor information, personalized mailing distribution label lists, or any other requests for advertising assistance.

The NSTC's catalogue and most current calendar of scheduled classes are available for your use in course planning and advanced advertising. These documents are kept up-to-date and are available on the Internet at: www4.jsc.nasa.gov/safety/Training. From there, you can scroll down and select either the NSTC Catalogue or the NSTC calendar (month-by-month). Alternately, you can go to the JSC internal home page, select the safety and total health icon, and select the "training" tab at the left of that page. If anyone has a problem accessing this information, please contact the NSTC.

Course Recognition

Student rosters and certificates of course completion signed by the NASA Headquarters Safety Director and the course instructor are issued to those who successfully complete NSTC course requirements for NASA Videoteleconferencing System (ViTS) and instructor-led classroom training. All civil service employees' information will also be provided to your Center's Human Resources office to be included on your permanent personal training record. NSTC courses qualify for the award of continuing education units (CEUs), and are also now approved for award of Certification Maintenance (CM) and Industrial Hygiene Certification Maintenance (IH CM) points from the American Board of Industrial Hygiene. CEUs will be awarded to students if course attendance requirements are met. They will be documented on the course completion certificate.

Some NSTC courses are developed using OSHA Training Institute materials to provide equivalent classroom training to the corresponding OSHA courses. Where possible, NSTC instructors of OSHA equivalent courses have been trained at the OSHA Institute or possess equivalent training and experience in the areas taught. OSHA training certificates are typically provided for the NSTC Construction Safety and Health course and for the NSTC General Industry Safety and Health course. For some shorter courses which may contribute to certifications (such as forklift safety) the NSTC provides individual cards which may serve as proof of receipt of the training.

Any questions regarding certificates or course attendance credit should be directed to Pamela Watson at (281) 244-1284 or Larry Gregg at (281) 244-1278.

Contact Information

NASA Safety Training Center

Muniz Engineering, Inc.
NASA/Johnson Space Center
Mailcode: NS225/MUN
Houston, Texas 77058
Commercial Telephone: (281) 244-1284, -1278, -1279, or -5105
Fax: (281) 483-9295
E-Mail: larry.gregg1@jsc.nasa.gov or mmwillia@ems.jsc.nasa.gov

Larry Gregg, NSTC Project Lead & Lead Instructor/Developer
Tim Evans, Instructor/Developer
Tom Torpey, Instructor/Developer
Marganette Williams, Administrative Lead
Pamela Watson, Administrative Staff
Polly Caison, Administrative Staff

Generally all questions concerning the NSTC should be directed to the NSTC Muniz Engineering (MEI) contractor staff. They conduct the annual training needs survey, manage course schedules, develop and instruct courses, and compile/maintain records on customer needs, course critiques, and student attendance. For government-to-government contact concerning the NSTC, its courses, or operations, Center safety offices may contact the following:

Tracy L. Fergurson, NASA/JSC, NSTC Contracting Officer Technical Representative
Code NS
Telephone: (281) 483-3548
Fax: (281) 483-6275

Jonathan B. Mullin, NASA/HQ
Manager, Operational Safety,
Safety and Risk Management Division
Code QS
Telephone: (202) 358-0589
Fax: (202) 358-3104

Center Training Coordinators

For more information regarding bringing courses to your Center, please contact your Center Training Coordinator. The following are the primary points of contact at each NASA Centers as of the date of publication.

<u>CENTER</u>	<u>NAME</u>	<u>TELEPHONE</u>
Ames Research Center	John Goldbach	(650) 604-2592
Dryden Flight Research Center	Ken Delaney	(661) 276-7903
Goddard Space Flight Center	Matt Jarvis	(301) 286-4126
Glenn Research Center	Jeannette P. Owens	(216) 433-2990
NASA Headquarters	Jon Mullin Sharon Boykins	(202) 358-0589 (301) 286-7508
Jet Propulsion Laboratory	Elaine Cottle	(818) 354-4710
Johnson Space Center	Tracy Fergurson	(281) 483-3548
Kennedy Space Center	Lynn Barnette	(321) 867-3486
Langley Research Center	Troy Middleton	(757) 864-6948
Marshall Space Flight Center	Georgann Crump	(256) 544-6525
Michoud Assembly Facility	Richard Schneider	(504) 257-1802
Stennis Space Center	Selena Ladner	(228) 688-1289
Wallops Flight Facility	Marvin Bunting	(757) 824-2030
White Sands Test Facility	Don Hall	(505) 524-5321

Courses and Training

The course descriptions in this catalogue are organized into four functional area categories and include such pertinent data as suggested target audience, course reference number, course topics, preferred delivery method, and available CEUs/CM's. The four categories are Safety Engineering, Occupational/Industrial Health and Safety, Fire Safety, and Special Programs.

COURSE DESCRIPTIONS

Fire Safety

NSTC 207, Fire Protection - Theory and Practice (3 Days)

This is a basic course that introduces the student to the recognition of potential fire hazards and procedures to minimize losses due to fires. Topics include previous and current trends in fire losses, the chemistry and mechanics of fire, fire prevention, fire detection, and fire suppression. 29 CFR Subparts E and L, the NASA Safety Standard for Fire Protection (NASA-STD-8719.11), and current NFPA codes and standards provide the basis for the course.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Fire Protection Professionals who are responsible for reviewing and designing drawings and inspecting facilities for fire safety.

CEUs: 1.8

NSTC 217, Life Safety Code (3 Days)

This course addresses the Life Safety Code (NFPA 101). It is an overview of the NFPA's code to protect people from fire in buildings and structures. Discussions will primarily focus on chapters 1 through 7, which address fundamental requirements, classification of occupancy and hazard of contents, means of egress, protection equipment, specific occupancies, and operation features. In addition, several occupancy chapters commonly applicable at NASA facilities are also discussed. A calculator is needed during this class

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Fire Protection Professionals who are responsible for reviewing and designing drawings and inspecting facilities for fire safety.

CEUs: 1.8

Occupational/Industrial Health and Safety

NSTC 051, Explosive Safety Management and Engineering (5 Days)

This two-part course covers the requirements for NASA explosive safety programs and their management as defined in NSS 1740.12, "NASA Safety Standard for Explosives, Propellants, and Pyrotechnics". Also covered are basic engineering concepts requirements in TM5-1300/NAVFAC P-397/AFM 88-22, "Structures to Resist the Effects of Accidental Explosions", and DOD 6055.9-STD, "Ammunition and Explosives Safety". It provides basic information covering explosives safety engineering principles and requirements for NASA. The course includes hands on demonstrations of software currently available to calculate explosive overpressures, fragment velocities, quantity distance calculations, etc., and exercises to try out tools and techniques discussed. A calculator is required for this class. A laptop computer will be required for the second part of this class. Note, this course replaces NSTC course 007, Explosive Safety Engineering, which will no longer be offered; and the first three days of this class are essentially the same as NSTC 010, Explosive Safety Program Management, which will also no longer be offered. Personnel who have taken NSTC course 010 should contact the NSTC for guidance if they desire to take only the engineering portion of the class. Course topics include:

1. What are the effects of an explosion?
2. What are the effects of fragments?
3. How can personnel/facilities be protected from explosive effects?
4. How do I site my facilities to reduce the effects from an explosion?
5. How do I build my facilities to reduce the effects from an explosion?
6. What type of tools are available to perform the job?

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Engineers with responsibility for designing new or modifying existing explosives, propellant, or pyrotechnics storage, manufacturing, and test facilities
- Managers of explosives, propellant, or pyrotechnics storage areas
Supervisory personnel managing the storage and handling of explosive devices.
- Anyone working with explosives, propellant, or pyrotechnics

CEUs: 3.0

**NSTC 009, Refresher Course for Explosives Handlers and Operational Personnel
(formerly Explosive Handler's, new name only,
(8 Hours)**

This course covers safe practices for handling, storing, shipping, and testing explosive systems, components and devices. It is specifically designed for technicians, supervisors, test engineers, and managers that are involved with routine procedures at test sites and operations facilities.

The core subjects, which address basic explosives safety, are supplemented by center-specific training material. This course can be tailored to meet local requirements and is ideal for annual refresher training.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Technicians, Engineers, and Managers subject to safety requirements at explosives work sites.

CEUs: .6

NSTC 010, Explosive Safety Program Management *(No longer offered, subject matter integrated into NSTC course 051, Explosive Safety Management and Engineering)*

**NSTC 028, Crane Operations and Rigging Safety Refresher (formerly Overhead Crane Refresher)
(3 Hours)**

This course serves as a refresher in overhead crane safety and awareness for operators, riggers, signalmen, supervisors, and safety personnel and to update their understanding of existing Federal and NASA standards and regulations related to such cranes. Areas of concentration include: general safety in crane operations, testing, inspections, pre-lift plans, and safe rigging. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with delivery of another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination. This course is intended to provide the classroom training for re-certification of already qualified crane operators, or for those who have only a limited need for overhead crane safety knowledge.

Target Audience:

- Crane Operators
- Riggers
- Signalmen.
- Site Supervisors.
- Safety Personnel & others involved with cranes and/or material handling at NASA facilities.

No CEUs are available for this course.

NSTC 030, Aerial Platform (2 Hours)

This course provides classroom training as required by OSHA 29 CFR 1910.67(C)(2)(ii). This course provides the classroom training to allow employees to have on-site hands-on field training and testing to obtain site approval for use of aerial lifts on a NASA site. Discussions include the awareness of hazards and how to gain from lessons learned. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Supervisors over aerial lift operations.
- Aerial lift operators.

No CEUs are available for this course.

NSTC 036, Battery Safety (2 Days)

This course will provide the student with an understanding of battery operations and hazards in NASA. Basic principles of batteries will be discussed in addition to safety requirements and controls for their hazards. The course will include discussion of NASA, OSHA, and other safety requirements for battery design and usage. Specific NASA applications of battery technology including STS/ISS payload safety along with their safety requirements and issues will be discussed including use of Commercial-Off-The-Shelf (COTS) batteries.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Supervisors managing the usage and handling of batteries, science and engineering personnel designing, planning and operating battery powered systems (including payloads)
- Technical personnel performing maintenance and operations for battery systems.

CEUs: 1.2

NSTC 200, Construction Safety and Health (4 Days)

This course assists the student in effectively conducting construction inspections and oversight. Participants are provided with basic information about construction standards, construction hazards and control, health hazards, trenching and excavation operations, cranes, electrical hazards in construction, steel erection, ladders, scaffolds, concrete, and heavy construction equipment. This course is based on the OSHA Training Institute Construction Safety course and is approved for award of the OSHA course completion card. Course may include a field exercise at a construction site if feasible.

Target Audience:

- Professional Safety and Health personnel.
- Construction Managers, Construction Site Inspectors, and those whose day-to-day duties include construction work.

CEUs: 2.4

NSTC 0201, Construction Safety and Health Overview

(1-1/2 Days)

This course is intended to provide an overview of construction industry safety and health standards to entry-level workers, Managers, Supervisors and safety professionals. It is based on the OSHA 10-hour construction safety and health course. The five one-hour mandatory topics areas are listed below, and each center should choose five other one-hour topic areas must be chosen from the options provided below. Attendance to the 10-hour class will result in the student receiving a card of completion from OSHA. Those whose day-to-day work involves construction should take NSTC course 0200, Construction Safety and Health.

REQUIRED COURSE TOPICS:

(One Hour Total)

- Introduction to OSHA
- OSH Act/General Duty Clause 5(a)(1)
- Subpart C: General Safety and Health
- Provisions, Competent Person
- Record keeping (CFR Part 1904)

(One Hour Each)

- Subpart K: Electrical
- Subpart M: Fall Protection
- Subpart E: Personal Protective and Lifesaving Equipment
- Subpart X: Stairways and Ladders

OPTIONAL COURSE TOPICS: Choose five:

(One Hour each)

- Subpart F: Fire Protection and Prevention
- Subpart H: Materials Handling, Storage, Use and Disposal
- Subpart I: Tools - Hand and Power
- Subpart L: Scaffolds

- Subpart N: Cranes, Derricks, Hoists, Elevators, and Conveyors
- Subparts O, W and G: Motor Vehicles, Mechanized Equipment
- Subpart P: Excavations
- Subpart Q: Concrete and Masonry Construction
- Confined Space Entry

Target Audience:

- Entry level construction workers
- Managers, supervisors, and safety and health professionals who need only a basic knowledge of safety and health issues associated with construction

CEUs: .9

**NSTC 204, Machinery and Machine Guarding
(3 Days)**

This course provides the student with an in-depth understanding of NASA and OSHA requirements for machinery and machine guarding. It is based on the OSHA Training Institute Machinery and Machine Guarding course, and provides the foundation for meeting our goal of contributing to improving the overall safety of NASA operations. The course also includes an overview of various types of common machinery used at NASA, and the safety standards relating to those types of machines. This course will include a 3-hour module on Lockout/Tagout suitable for attendance by non-class personnel on a space available basis (see description for course 814).

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Maintenance Repair Supervisors, fabrication shop personnel, and anyone working around or with machinery.

CEUs: 1.8

NSTC 205, Overhead Cranes and Material Handling (2 Days)

The primary purpose of the course is to promote overhead crane safety and awareness for operators, riggers, signalmen, supervisors, and safety personnel; and to further their understanding of the Federal and NASA standards and regulations related to such cranes. This course introduces the student to various types of overhead and gantry cranes and hoists used in general industry and construction operations; and includes a review of the pertinent OSHA and ANSI standards and NASA requirements. Students are provided with basic information concerning crane safety, crane operations, crane inspections and maintenance, pre-lift plans, wire rope, rigging components and rigging safety. The course is intended to provide the basic knowledge (both in breadth and in depth) for those operating in and around overhead cranes. It will provide classroom training which, when combined with the center's own hands-on training, will serve to certify overhead crane operators as required.

Target Audience:

- Crane Operators.
- Crane Site Supervisors.
- Signalmen.
- Safety Personnel.
- Riggers.
- Others involved with cranes and/or material handling at NASA facilities.

CEUs: 1.2

NSTC 208, Mobile Crane Safety (2 Days)

The primary purpose of the course is to promote mobile crane safety awareness for operators, riggers, signalmen, supervisors, and safety personnel and to further their understanding of Federal and NASA standards and regulations related to such cranes. This course introduces the student to various types of mobile cranes, and provides a review of the pertinent OSHA and ANSI standards and NASA requirements. Students are provided with basic information concerning crane safety, crane operations, crane inspections and maintenance, pre-lift plans, wire rope, rigging components, and rigging safety. The course is intended to provide the basic knowledge (both in breadth and in depth) for those operating in and around mobile cranes. It will provide classroom training which, when combined with the center's own hands-on training, will serve to certify overhead crane operators as required.

Target Audience:

- People who work with operators and riggers.
- Construction Safety personnel.
- Managers who oversee operations using mobile cranes.

CEUs: 1.2

NSTC 209, Forklift Safety (3 Hours)

This course provides 3 classroom hours of training followed by a written exam. The basis for the course is OSHA 29 CFR 1910.178(L). Discussions include the awareness of hazards and how to gain from lessons learned. Other topics include the mechanics of a fork truck, inspections and maintenance, safe driving, pedestrian and traffic rules, special operating rules, stacking and tiering, and emergency procedures and refueling. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Forklift operators
- Safety personnel.

No CEUs available.

NSTC 210, Forklift Safety Refresher (2 Hours)

This course provides for a re-certification refresher followed by a written exam. The basis for the course is OSHA 29 CFR 1910.178(L). Discussions include the awareness of hazards and how to gain from lessons learned. Other topics include the mechanics of a fork truck, inspections and maintenance, safe driving, pedestrian and traffic rules, special operating rules, stacking and tiering, and emergency procedures and refueling. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with delivery of another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Supervisors over forklift operations.
- Forklift operators.
- Safety personnel.

No CEUs available.

NSTC 224, Laboratory Safety and Health (2 Days)

This course addresses topics useful in preventing disease and injury among laboratory workers and prepares laboratory workers and supervisors, industrial hygienists, and safety professionals to recognize, evaluate, and control the hazards that are specific to this type of workplace. The course includes discussion of the OSHA Laboratory Standard, 29 CFR 1910.1450, and implementation of Chemical Hygiene Plans as well as discussion of chemical and physical hazards in laboratories.

Target Audience:

- Laboratory, Safety, Reliability, Quality, and Maintainability, and Health Professionals and Managers.
- Industrial Hygienists.
- Lab workers or anyone working in or around a laboratory.

CEUs: 1.2

NSTC 225, Occupational Ergonomics (2 Days)

This course introduces the student to the application of ergonomic principles in the design of office and industrial workstations, tools, and procedures. It discusses worker/machine trade-off and human factor considerations for the reduction of stress and strain to the employee's body in order to improve safety and employee performance. The topics include: cumulative trauma disorders, back injuries, biomechanics, anthropometry, industrial risk factors, tool design, materials handling, video display terminals, workstation design, and ergonomics regulations and guidelines. Course highlights include industrial and office case studies as well as workshops in workstation and task evaluation.

Target Audience: Safety, Reliability, Quality, Maintainability, Health Professionals and Managers.

CEUs: 1.2

NSTC 309, Electrical Safety Standards (3 Days)

This course is designed to provide the student with an in-depth study of OSHA's electrical standards, and hazards associated with electrical installations and equipment. The first day provides a review of electricity fundamentals for those who need it. Topics include single- and three-phase systems, cord- and plug-connected and fixed equipment, grounding, ground fault circuit interrupters, hazardous locations, and safety-related work practices. Emphasis is placed on electrical hazard recognition and OSHA standards. This course will include a 3-hour module on Lockout/Tagout suitable for attendance by non-class personnel on a space available basis (see description for course 814). A 3-hour Electrical Safety Refresher is available for those who have previously taken this course (see description for course 0310).

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Electrical Design Engineers, and anyone working around or with electrical systems.

CEUs: 1.8

NSTC 310, Electrical Safety Refresher (3 Hours)

This course is designed to provide the student with a review of OSHA electrical standards, and the hazards associated with electrical installations and equipment. Topics may include single- and three-phase systems, cord- and plug-connected and fixed equipment, grounding, ground fault circuit interrupters, hazardous locations, and safety-related work practices. Emphasis is placed on discussion of those areas most pertinent to the class makeup and needs. This course is designed for those who have either taken the 3-day NSTC course 0309, Electrical Safety Standards, or who have a lot of experience working with electrical systems. It may also be used for those who have a need for only electrical safety awareness, and who do not work with electrical systems on a regular basis.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Electrical Design Engineers, and anyone working around or with electrical systems.

No CEUs are available for this course.

NSTC 311, Fall Protection (2 Days)

This course is designed to establish an understanding of NASA and OSHA requirements for fall protection and knowledge of systems that can satisfy those requirements. The course includes an overview of these subjects, an in-class exercise to produce familiarity with requirements, demonstration of hardware, and discussion of fall protection planning. This course is based on the OSHA Training Institute Fall Arrest Systems course. This course will be significant for those who supervise or have safety oversight/inspection responsibilities for operations in elevated environments where fall protection is required.

Target Audience: Safety, Reliability, Quality, and Maintainability Professionals and individuals working in elevated environments where fall protection is required.

CEUs: 1.2

NSTC 044, Fall Protection Refresher (3 Hours)

This course is designed to provide an overview or refresher of fall protection hazards, needs, and requirements for those who may be using fall protection during the performance of their duties. Basic requirements of NASA and OSHA fall protection standards will be discussed along with an overview of protective devices and procedures. This course is based on the OSHA Training Institute Fall Arrest Systems course. This course is intended as a refresher for those who have the need to use fall protection equipment in the performance of their duties, and/or for those with safety oversight/inspection responsibilities for operations in elevated environments where fall protection is required. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Individuals working in elevated environments where fall protection is required.

No CEUs available

NSTC 312, Scaffolding Safety (3 Days)

This course is based on OSHA CFR 1910.28 and 1926.451, requirements for scaffolding safety in the general and construction industries. During the course, discussions will focus on standards, the required training, definition and duties of a competent person, design and safety factors, terminology and inspection of scaffold components, types of scaffolds, uses of scaffolds, ladder access to scaffolds, fall protection requirements, signs and barricades, etc. When possible, the class will include a hands-on exercise in erection, inspection, and/or teardown of an actual scaffold.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors for construction and other work which uses scaffolds.
- Anyone working on operations requiring the use of scaffolds.

CEUs: 1.8

NSTC 316, Scaffold User's Seminar (4 Hours)

This course is based on OSHA CFR 1910.28 and 1926.451, requirements for scaffolding safety in the general and construction industries. During the course, the student will receive an overview of those topics needed to work safely on scaffolds including: standards, terminology and inspection of scaffold components, uses of scaffolds, fall protection requirements, signs and barricades, etc. Those individuals desiring to become “competent persons” for scaffolds should take the 3-day Scaffold Safety course, NSTC 312. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Anyone working on operations requiring the use of scaffolds.

No CEUs available

NSTC 313, Cryogenics Safety (2 Days)

This course is designed as a stand-alone course in cryogenics that addresses the safety requirements and potential hazards associated with processes and phenomena in the temperature region below -150°C (-238°F). OSHA, DoD, and NASA safety requirements are included as sources. The course will also cover important design and operational safety considerations for the delivery and control of cryogenics (both flight and ground based systems and vessels). These considerations include materials compatibility, dimensional contraction, impact sensitivity, condensation, cleanliness requirements, purge procedures, disposal, and chill-down techniques. This course will include a 3-hour module on Confined Space safety suitable for attendance by non-class personnel on a space available basis (see description for course 806).

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Fluid System Design Engineers, and anyone working around or with cryogenic systems.

CEUs: 1.2

NSTC 314, Liquid Nitrogen Handlers' Course (3 Hours)

This course addresses the hazards of cryogenic liquid nitrogen usage and handling, and the techniques for controlling these hazards. The bases for this course include OSHA and NASA documentation and NASA applications and mishaps. The content includes: fundamentals of liquid nitrogen (physical and chemical characteristics); hazards of liquid nitrogen; safeguards for usage and handling of liquid nitrogen; safety features for storage, transfer, and transportation of liquid nitrogen; and emergency procedures and disposal of liquid nitrogen. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors managing the usage and handling of liquid nitrogen, science and engineering personnel designing, planning and operating liquid nitrogen systems
- Technical personnel performing maintenance and operations for liquid nitrogen systems.

No CEUs are available for this course.

NSTC 315, Safety in High Pressure Systems (formerly High Pressure System Safety)
(2 Days)

This is a stand-alone course in liquid and gaseous high-pressure systems that addresses the safety requirements and potential hazards associated with these systems and their operations. This course will cover important operating and design considerations for pressure vessels/systems. These considerations include inspection and test requirements, the certification/re-certification process, and hazards (such as vessel rupture, blast effects, fragmentation, and leakage of flammable, toxic, and asphyxiating fluids/gasses) and hazard analysis. The focus of the course is on ground high-pressure systems – flight/payload system requirements will not be discussed.

Target Audience:

- Systems Engineers, Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Foremen, Technicians/Operators or Pressure Systems
- Those whose activities are associated with or come in contact with fluid systems

CEUs: 1.2

NSTC 317, Safety in High Pressure Operations
(1 Day)

This is a modified version of the two-day NSTC class on safety in liquid and gaseous high-pressure systems that concentrates on those elements that are necessary for technicians and operators of such systems. It addresses the safety requirements and potential hazards associated with these systems and their operations. This course will cover important operating considerations for pressure vessels/systems including inspection and test requirements, the certification/re-certification process, and hazards (such as vessel rupture, blast effects, fragmentation, and leakage of flammable, toxic, and asphyxiating fluids/gasses). The focus of the course is on ground high-pressure gaseous systems - flight/payload system requirements will not be discussed.

Target Audience:

- Systems Engineers, Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Foremen, Technicians/Operators or Pressure Systems
- Those whose activities are associated with or come in contact with fluid systems

CEUs: .6

NSTC 056, Flexible Hose Safety (4 hours)

This course addresses topics such as: an introduction to existing standards for high pressure operations; marking and tagging of high pressure components; inspection items for high pressure systems/components; design and fabrication of flex hoses/connections & restraints; proof/periodic testing; and operations concerns of working with flex hoses in high pressure - connecting, torquing, restraints, etc. This course will make maximum use of lessons learned from NASA mishaps and close calls to drive home the hazards associated with flex hoses and high-pressure system operations. This course will normally only be given in conjunction with Safety in High Pressure Systems, NSTC course 0315, unless there are enough students to justify multiple course deliveries. Check with the NSTC management staff.

Target Audience:

- Systems Engineers, Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Foremen, Technicians/Operators or Pressure Systems
- Those whose activities are associated with or come in contact with fluid systems

No CEUs are available for this course

NSTC 0318, Compressed Gas Trailer Safety (1 Day)

This is a course that addresses the safety requirements and potential hazards associated with compressed gas trailers, some common commodities, typical trailer configurations and components, and their operations.

The focus of the course is on compressed gas trailers as applied to small or temporary usage requirements for compressed gasses to support facility needs.

This course covers important trailer considerations associated with gaseous commodities, components and systems typically found on compressed gas trailers and trailer operating procedures. These considerations include properties of common trailer supplied gasses used at NASA Centers and facilities, typical trailer system components, and hazards associated with tube trailer operations experienced during compressed gas trailer fill, withdrawal and securing operations.

Target Audience:

- Systems Engineers, Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Foremen, Technicians/Operators or Pressure Systems
- Those who may work around or are directly associated with compressed gas trailers.

CEUs: 0.6 are available for this course

NSTC 0319, Compressed Gas Cylinder Safety

(4 Hours)

This course seeks to enhance the safety aspects of using, storing, and handling compressed gas cylinders. It addresses topics such as: An introduction to existing standards and requirements for gas cylinders, properties and hazards of common cylinder gases, operations and storage, marking and tagging, inspection items for cylinders and their components, and use of flex hoses & restraints. This course will include the use of lessons learned from NASA mishaps and close calls to drive home the hazards associated with typical compressed gas cylinder operations. This class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Facility/Lab system safety, quality, and maintainability professionals
- Operators, technicians, supervisors and others who may have the occasion to inspect and/or work around/with compressed gas cylinders and/or who may write procedures including the use of compressed gas cylinders

No CEUs available

NSTC 037, Hydrogen Safety

(2 Days)

This course provides training on guidelines for hydrogen system design, materials selection, operations, storage, and transportation. It will cover both ground and flight systems and both liquid and gaseous hydrogen applications. The student will understand the hazardous characteristics of hydrogen and methods for controlling those hazardous characteristics and responding to emergency situations involving hydrogen. The course has been developed primarily in accordance with NSS 1740.16, Safety Standard for Hydrogen and Hydrogen Systems. It covers properties and hazards of both liquid and gaseous hydrogen, design and operations in hydrogen facilities, materials selection for use in hydrogen systems, storage vessels, piping, and component considerations, hydrogen leak and fire detection practices, operating and transportation principles and procedures, and emergency practices and considerations. Specific reference will be made to STS payload considerations.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Payload and Facility Design Engineers.
- Test Team Personnel for operations using hydrogen.
- Supervisors of and anyone working around systems using hydrogen

CEUs: 1.2

NSTC Course 054, Safety in Hydrogen System Operations (1 Day)

This is a modified version of NSTC course 037, Hydrogen Safety, that concentrates on those elements of hydrogen safety that are necessary for technicians and operators of such systems. It addresses the safety requirements and potential hazards associated with these systems and their operations. This course will cover important operating considerations for hydrogen systems including: properties and hazards of both liquid and gaseous hydrogen, materials selection for use in hydrogen systems, storage vessels, piping, and component considerations, hydrogen leak and fire detection practices, operating and transportation principles and procedures, and emergency practices and considerations.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Supervisors of hydrogen operations
- Anyone designing, writing procedures for, or working with/around hydrogen systems

CEUs: 0.6

NSTC 054A, Hydrogen Safety Operations

(4-6 Hours)

This is a 1-day (4-6 hours) course geared toward personnel who perform hands-on operations involving hydrogen. The course presents the properties and hazards of both liquid and gaseous hydrogen, general safety, handling, and maintenance considerations, component and materials issues for hydrogen systems, hydrogen leak and fire detection practices, operating principles and procedures, and emergency practices and procedures. The course features classroom interaction designed to share the experience of the attendees as well as promote discussion of local issues.

Attendees of this course will:

- Achieve an understanding of safe practices in the operation and maintenance of a hydrogen system
- Recognize the physical principles and empirical observations on which these safe practices are based
- Be able to identify and evaluate hazards in a hydrogen system

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Test team personnel, technicians, and others who work with and/or assemble hydrogen systems
- Facility operators and anyone else working around or with hydrogen

No CEUs available

NSTC 040, Hypergol Safety (No longer offered, subject matter integrated into NSTC course 055, Hypergol Systems: Design, Buildup, and Operation)

NSTC 055, Hypergol Systems: Design, Buildup, and Operation. (2.0 Days)

This course discusses the use of hypergols (hydrazine fuels and nitrogen tetroxide) in NASA applications. During the course, we will identify the hazards associated with the use of hypergols including: toxicity, reactivity, fire, and explosion. Management of hypergol safety risk is discussed in terms of the primary engineering controls – design, buildup, and operation; and secondary controls – personal protective equipment and detectors/monitors. The emphasis is on the buildup of compatible systems and the safe operation of these systems by technicians. NSTC course 040, is no longer offered.

Target Audience:

- Technicians, plant managers, and operators involved in hypergol system design, buildup, operation, and maintenance
- Safety and Health Professionals involved in monitoring and evaluating the operation of hypergol systems

CEUs: 1.2

NSTC 052, Fire Hazards in Oxygen Systems (2 Days)

Through this course, the student will learn to identify and evaluate hazards in oxygen systems. The instructors will discuss safe practices in design, materials selection, and operation of oxygen systems, as well as reviewing/providing related ASTM standards to the student. As a result of attendance, the student will: understand physical principles and empirical observations related to operations involving oxygen systems and the safe practices resulting from them; become familiar with the information needed to cope with fire hazards in oxygen systems; and become familiar with these design principles through in-class exercises. Course topics include: the need for oxygen compatibility, concepts of safety risk and safety risk management in oxygen systems/operations, ASTM Standard Guides for use with oxygen systems/operations, related ASTM test methods for combustion hazards in oxygen systems, how NASA handles oxygen compatibility, and future trends

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Engineers, scientists, technicians, purchasing agents, plant managers and operators involved in the production and use of liquid or gaseous oxygen; or oxygen enriched gas mixtures.
- Those who supply, design, or manufacture hardware for oxygen services.

CEUs: 1.2

NSTC 053, Oxygen Systems: Operation and Maintenance (4 Hours)

This course addresses topics such as oxygen compatibility, identifying and evaluating hazards in oxygen systems, managing safety risks in oxygen systems, minimizing the severity of the environment, choosing materials to withstand the environment, and good practices for oxygen systems operation and maintenance. It is specifically intended for anyone who operates or maintains any type of oxygen system. Those who take the Fire Hazards in Oxygen Systems course should not take this course except as a periodic refresher.

Target Audience: Technicians, plant managers and operators, and safety professionals involved in oxygen systems maintenance and operations

No CEUs are available for this course

NSTC Course 047, OSHA Record Keeping Seminar (3 Hours)

This seminar will assist the student in understanding the new OSHA rules and requirements for record keeping. The 29 CFR 1940 Recording and Reporting Occupational Injuries and Illnesses has been completely revised and the new rules took effect on January 1, 2002. Everything concerning this new standard from the scope of “who must comply”, to the new more specifically defined “work-related recording criteria” is outlined in this seminar. Several examples of the “old rule” compared to the “new rule” are presented to aid those making the transition. Workshop activities accomplished during class include discussion of some “sanitized” case histories for determination of “recordables.” This seminar is recommended for those who are responsible for reporting occupational injuries and illnesses at their work sites.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Supervisors and Managers.
- Anyone who may be responsible for reporting/recording occupational injuries and illnesses in the workplace.

No CEUs are available for this course

NSTC 501, General Industry Safety and Health (5 Days/36 Hours)

This course is intended to provide instruction on general industry safety and health topics at the introductory level. Examples of topics include an introduction to OSHA standards, lockout/tagout, confined space electrical safety, and hazard communications. CFR 1910, Occupational Safety and Health Standards, is the primary source document for this course. NASA Headquarters level safety documentation, and NASA mishap examples and experience have been integrated into the OSHA-provided course material. Preferred method of delivery for this course is via a multi-session presentation on ViTS, but it may be delivered by instructors at a center if needed. Please contact the NSTC management staff directly for determination of need/availability of the instructor-led version of this class for presentation at your location.

Target Audience: Managers, Technical Personnel, and Safety Professionals who need a basic understanding of OSHA requirements.

CEUs 3.0

NSTC 806, Confined Space Safety (3 Hours)

The purpose of this course is to provide employees with the standards, procedures, and requirements necessary for safe entry to and operations in confined spaces. OSHA standard 29 CFR 1910.146, "Confined Space," is the basis for this course. The course covers the hazards of working in or around a confined space and the precautions you should take to control these hazards. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination. This course is also given as module during the Cryogenics Safety class during which attendance is open (on a space-available basis) to non-class students.

Target Audience:

- Supervisors and employees required to work in confined spaces.
- Safety professionals
- Facility managers of facilities containing confined spaces.

No CEUs available.

NSTC 814, Lockout/Tagout (3 Hours)

The purpose of this course is to provide employees with the standards, procedures, and requirements necessary for the control of hazardous energy through lockout and tagout of energy-isolating devices. OSHA standard 29 CFR 1910.147, "The Control of Hazardous Energy (Lockout/Tagout)," is the basis for this course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination. This course is also given as module during the Electrical Safety and Machinery/Machine Guarding classes during which attendance is open (on a space-available basis) to non-class students.

Target Audience:

- Supervisors and Craftsmen in servicing and maintenance.
- Safety professionals.

No CEUs available

NSTC 039, Establishing, Maintaining, and Assessing OSHA Voluntary Protection Program (VPP) Compliant Safety and Health Programs (2 Days)

This course will provide knowledge and understanding the OSHA Voluntary Protection Program, including in-depth discussions of the 32 program elements and how to implement them. The course will address the use of the Performance Evaluation Profile (PEP) technique to assess and compare management and employee attitudes and assessments of safety; and will discuss techniques to reduce gaps between management and employee ratings, and to raise low ratings. The course includes a discussion of the NASA requirements for Operational Readiness Inspections (ORI), User Readiness Reviews (URR) and Test Readiness Reviews (TRR) to ensure safety of NASA facilities, operations, and tests. It will additionally address the elements of the NASA Headquarters Agency Safety Initiative (ASI), which directs all Centers to become VPP certified.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- NASA mid- and upper-level managers, supervisors, and others tasked with ensuring the existence of a safe work environment through policy, planning, and control of activities
- All who are interested in becoming familiar with VPP

CEUs: 1.2

NSTC 057, Hand and Power Tool Seminar

(2 Hours)

This course is based on OSHA CFR 1910.28 and 1926.451, requirements for working with hand tools safely in the general and construction industries. During the course, the student will receive an overview of those topics needed to work safely with hand and power tools including: standards, terminology, inspection of hand and power tool components, and proper usage. Those individuals desiring to become “competent persons” in hand and power tool operations should consult the manufacturer. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Anyone working on operations requiring the use of hand and power tools.

No CEUs available

**NSTC 058, Fall Protection for Construction
(3 Hours)**

This course is designed to provide an overview or refresher training of the CFR 1926.500 Subpart M for fall protection. The course includes fall hazards, needs, and requirements for those who may be using fall protection during the performance of their duties. Basic requirements of NASA and OSHA fall protection standards will be discussed along with an overview of protective devices and procedures. This course is based on the OSHA Training Institute Fall Arrest Systems course. This course is intended for those working in elevated environments in the performance of their duties, and/or for those with safety oversight and inspection responsibilities for operations in elevated environments where fall protection is required. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Individuals working in elevated environments where fall protection is required.
- Those working on construction sites.

No CEUs available

NSTC 045, Excavation and Trenching Safety (3 Hours)

The purpose of this course is to provide employees with the standards, procedures, and practices necessary to meet the standards in CFR 1926.650 Subpart P – Excavations and Trenching Construction. Excavation, trenching, and soil testing are the fundamental concepts covered in this course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Supervisors and Craftsmen involved in excavation/trenching activities
- Those working on construction sites.

No CEUs available

NSTC 059, Safety of Mobile Cranes, Derricks, Hoists, Elevators and Conveyors in Construction (3 Hours)

The primary purpose of the course is to provide employees with the standards, procedures, and requirements necessary to meet CFR 1926.550 Subpart N, Mobile Crane and Derricks. The course goal is to increase safety awareness for operators, riggers, signalmen, supervisors, and safety personnel involved in construction operations; and to further their understanding of safety standards and regulations related to lifting devices. This course introduces the student to the pertinent requirements in OSHA 1926.550, ANSI standards, and NASA requirements. Students are provided with basic information concerning crane safety, crane operations, crane inspections and maintenance, pre-lift plans, wire rope, rigging components, and rigging safety. The course is intended to provide the basic for those operating in and around mobile cranes. Those individuals desiring to become “competent persons” for Mobile Cranes and Derricks should take the 2-day Mobile Crane Safety course, NSTC 208. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel
- Operators and managers who oversee construction operations using mobile cranes or other lifting devices

No CEUs available

NSTC 060, Steel Erection (3 Hours)

The primary purpose of the course is to provide employees with the standards, procedures, and requirements necessary for safe operations involving erection of steel structures. The course will emphasize safety awareness for steel erectors, supervisors, and safety personnel and will further their understanding of standards and regulations related to such work including OSHA 1926.750 Subpart R, ANSI standards, and NASA requirements. Students are provided with basic information concerning scope and application, definitions, site layout, erection plan, hoisting and rigging, and structural steel assembly. Those individuals desiring to become “competent persons” in steel erecting should take the NSTC Construction Safety and Health course, NSTC 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Those who work with steel erection operations.
- Construction Safety personnel.
- Managers who oversee steel erection operations.

No CEUs available

NSTC 061, Signs, Signals, and Barricades Seminar (2 Hours)

This course is based on OSHA CFR 1926.200, requirements for working with signs, signals, and barricades in the construction industry. In this course, the student will receive an overview of those topics needed to work safely in circumstances where signs, signals, and/or barricades are required. Topics covered include: 1926.200 OSHA standards, terminology, and proper usage. Those individuals desiring to become “competent persons” on signs, signals, and barricades should take the NSTC 200 Construction Safety and Health course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Those who work in activities involving the need for signs, signals, and barricades.
- Managers who oversee construction operations.

No CEUs available

NSTC 062, Occupational Health and Environmental Controls Seminar

(3 Hours)

This course is based on OSHA CFR 1926.50, requirements for medical services and first aid, sanitation (1926.51), occupational noise (1926.52), ionizing radiation (1926.53), non-ionizing radiation (1926.54), hazard communication (1926.59), lead (1926.62), and process safety management of highly hazardous chemicals (1926.64). During the course, the student will receive an overview of those topics as needed to work safely in construction operations. Individuals desiring to become “competent persons” on should take the OSHA 200 Construction 30 hour class. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Safety personnel.
- Those working on construction sites
- Supervisors and managers who oversee construction operations.

No CEUs available

NSTC 063 Material Handling, Storage, Use and Disposal**(3 Hours)**

This course is based on OSHA CFR 1926.250 - General Requirements for Storage, OSHA CFR 1926.251 - Rigging Equipment for Material Handling, and OSHA CFR 1926.252 - Disposal of Waste Materials for the Construction Industry. During the course, the student will receive an overview of these topics, which are needed in handling materials to meet the requirements of the OSHA 200 Construction Safety and Health Standards. Those individuals desiring to become “competent persons” should take the NSTC Construction Safety and Health course, NSTC 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Supervisors and managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 064, Welding and Cutting (3 Hours)

This course is based on OSHA CFR 1926.350 - Requirements for Working with Gas Welding and Cutting, 1926.351 - Arc Welding and Cutting, 1926.352 - Fire prevention, Ventilation and Protection in Welding Cutting and Heating, 1926.354 - Welding Cutting and Heating in way of Preservation Coating in the Construction Industry. During the course, the student will receive an overview of those topics needed to work safely in welding and cutting operations. Those individuals desiring to become “competent persons” should take the NSTC Construction Safety and Health course, NSTC 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 065, Stairway and Ladders Seminar (3 Hours)

This course is based on OSHA CFR 1926.1050 through 1926.1059 Subpart X - Stairways and Ladders. During the class, the student will become familiar with the general requirements for working on stairways and ladders (OSHA CFR 1926.1051), OSHA CFR 1926.1052 (stairways), OSHA CFR 1926.1053 (Ladders), and OSHA CFR 1926.1060 (training requirements in the construction industry). The student will be shown the working guidelines, training requirements and inspection requirements for ladders. Those individuals desiring to become “competent persons” on stairways and ladders should take the NSTC Construction Safety and Health course, NSTC 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 066, General Safety and Health Provisions Seminar (2 Hours)

This course is based on OSHA CFR 1926, Subpart C- 1926.20 - Requirements for General Safety and Health Provisions, OSHA CFR 1926.21 - Safety Training and Education, and OSHA CFR - 1926.25 Housekeeping. During the course, the student will receive an overview of those topics needed to work safely. Those individuals desiring to become “competent persons” should take the NSTC Construction Safety and Health course, NSTC course 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 067, Personal Protective and Life Saving Equipment Seminar (3 Hours)

This course is based on OSHA CFR 1926.95 through 1926.107 of the construction industry regulations, Subpart E, Personal Protective and Life Saving Equipment. During the course, the student will become familiar with the 1926.95 through 1926.107 regulations criteria for personal protective requirements in construction. And will receive an overview of those topics needed to apply the proper personal protection equipment. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 068, Demolition Seminar (3 Hours)

This course is based on OSHA CFR 1926.850 through 1926.859 Subpart T Demolition. The student will cover Preparatory Operations (1926.850), Chutes (1926.852), Material Removal (1926.853), Removal of Walls, Masonry Sections and Chimneys (1926.854), Manual Removal of Floors (1926.855), Storage (1926.857), and Mechanical Demolition (1926.859). During the course, the student will receive an overview of those topics needed to work safely in accomplishing demolition activities and will be shown the working guidelines, training requirements, and inspection to be accomplished before demolition is started. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 069, Concrete and Masonry Seminar (3 Hours)

This course is based on OSHA CFR 1926.700 through 1926.705 Subpart Q Concrete and Masonry Construction. The student will cover the Scope, application, and definitions applicable to this subpart, General requirements (1926.701), Equipment and tools (1926.702), Requirements for cast-in-place concrete (1926.703), General requirements for form work (1926.703), precast concrete (1926.704), Lift-slab operations (1926.705), Masonry construction (1926.706). During the course, the student will receive an overview of related OSHA 200 Construction Safety topics needed to work safely with this section. Training and inspection requirements before work is started. This section is covered in the NSTC Construction Safety and Health course, NSTC course 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations.
- Those working on construction sites.

No CEUs available

NSTC 070, Fire Protection and Prevention in Construction (3 hours)

This basic course introduces the student to the recognition of potential fire hazards and procedures required to meet the OSHA 1926.150 Fire protection, 1926.151 Fire Prevention, 1926.152 Flammable and combustible liquids, 1926.153 Liquefied petroleum gas, 1926.154 temporary heating devices, 1926.155 Definitions to this Subpart F to minimize losses due to fires. Those individuals desiring to become “competent persons” should take the NSTC Construction Safety and Health course, NSTC 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel
- Operators and managers who oversee construction operations

No CEUs available

NSTC 071, Underground Construction, Caissons, and Cofferdams (3 Hours)

This course is based on OSHA CFR 1926.800 through 1926.804 Subpart S, requirements for working underground construction, caissons, cofferdams, and compressed air in the construction industry. In this course, the student will receive an overview of the knowledge needed to work safely in circumstances which involve working with construction of underground tunnels, shafts, chambers, and passageways. Topics covered include: access and egress, safety instructions, tools and protective equipment, and compressed air. Those individuals desiring to become “competent persons” on underground construction should take the NSTC 200 Construction Safety and Health course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel working underground
- Managers who oversee underground construction operations.

No CEUs available

NSTC 072, Motor Vehicles, Mechanized Equipment, and Rollover Protective Structures and Overhead Protection (3 Hours)

This course is based on OSHA CFR 1926.600 through 1926.606 Subpart O (requirements for working with Equipment, Motor vehicles, Material handling equipment, Pile driving equipment, Site clearing, Marine operations and equipment used in the construction industry) and 1926.1000 through 1926.1003 Subpart W (rollover protection overhead structures; protection). In this course, the student will receive an overview of those topics needed to work safely. Those individuals desiring to become “competent persons” should take the NSTC 200 Construction Safety and Health course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with NSTC management staff.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel
- Managers who oversee construction operations.

No CEUs available

NSTC 073, Toxic and Hazardous Substances Seminar (Asbestos and Cadmium) (2 Hours)

This course is based on OSHA CFR 1926, Subpart C- 1926.1101 - Requirements for OSHA. General Safety and Health Provisions, Safety Training and Education. During the course, the student will receive an overview of those topics needed to work safely, exposure assessments and monitoring, understanding permissible exposure limits (PEL), respiratory protection, protective clothing, and respiratory protection. Those individuals desiring to become “competent persons” should take the NSTC Construction Safety and Health course, NSTC course 0200. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Managers who oversee operations & those working at construction sites

No CEUs available

NSTC 075, Power Transmission and Distribution Seminar

(2 Hours)

This course is based on OSHA CFR 1926.950 - 960 Subpart v, requirements for working with Power Transmission and Distribution in the construction industry. In this course, the student will receive an overview of those topics needed to work safely in circumstances where the construction of electric transmission and distribution lines and equipment are required. Topics covered include: 1926.950 OSHA standards, General requirements, 1926.951 Tools and Protective equipment, 1926.952 Mechanical equipment, 1926.953 Material Handling, 1926.954 Grounding for protection of employees, 1926.955 Overhead lines, 1926.956 Underground lines, 1926.957 Construction in energized substations, 1926.959 Lineman's body belts, safety straps and lanyards, 1926.960 Definitions applicable to this subpart. Those individuals desiring to become "competent persons" on power transmission and distribution should take the NSTC 200 Construction Safety and Health course. This course will primarily be presented via the NASA Videoteleconferencing system and the instructor-led version of this class will only be available if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Construction Safety personnel.
- Those who work in activities involving power transmission and distribution
- Managers/supervisors who oversee construction operations.

No CEUs available

Safety Engineering

NSTC 001, Facility System Safety (2 Days)

This course is designed to provide attendees with an understanding of system safety and how it applies to facility acquisition, modification, and operations. It is based on NASA Standard 8719.7, the NASA Facility System Safety Guidebook. The guidebook will be provided to the students as course material. The purpose of the course is to provide guidelines for personnel with facility safety responsibility to assist them in identifying and eliminating or controlling hazards throughout the facility life cycle. The course provides the logical framework necessary for implementing facility system safety as required by NPG 8715.3, the NASA Safety Manual. The course also addresses safety issues both from a management and engineering perspective. Topics of discussion include: System Safety Concepts; Hazard Identification, assessment, and control in the facility context; NASA facility acquisition process and integration of system safety into it; Annual safety survey and tracking procedures; Safety activities during facility/equipment integration & testing; Safety management during facility/equipment operations

Target Audience:

- Personnel with facility safety responsibility.
- Professionals involved in managing, performing, or reviewing of facility acquisitions, plans, designs, safety analyses, & operations.

CEUs: 1.2

NSTC 002, System Safety Fundamentals (4-3/4 Days)

This course instructs the student in the fundamentals of system safety management and hazard analysis of hardware, software, and operations. Basic concepts and principles of the analytical process are stressed. The student is introduced to NASA publications that require and guide safety analysis, as well as to general reference texts on subject areas covered. Types and techniques of hazard analysis are addressed in enough detail to give the student a working knowledge of their uses and how they are accomplished. Skill in analytical techniques is developed through the use of practical exercises worked by the students in class. This course establishes a foundation for the student to pursue more advanced studies of system safety and hazard analysis techniques while allowing students to effectively apply their skills to straightforward analytical assignments. Note: this course is a combination of NSTC course 008 (System Safety Workshop) and NSTC course 015 (System Safety Special Subjects). Students who have taken either of these classes should discuss taking this class with the NSTC management staff.

Target Audience:

- Supervisors.
- Any Technical or Non-Technical personnel who perform safety analysis and/or manage system safety programs

CEUs: 2.8

NSTC 008, System Safety Workshop (3 Days)

This course teaches the fundamentals of hazard recognition and analysis for hardware and operations. Basic hazard concepts and the basics of the analytical process are stressed. The student is introduced to NASA publications that require and guide safety analysis, and to general reference texts on subject areas covered. Types and techniques of hazard analysis are addressed in enough detail to give the student a working knowledge and provide a basis for continued refinement of analytical skills. Extensive use of in-class workshops and group exercises allow hands-on practice in techniques discussed. Note: students who have attended NSTC course 002 should not attend this course.

Target Audience:

- Technical Interns.
- Supervisors.
- Any Technical or Non-Technical personnel who perform safety analysis or who are interested in making their hardware safe.

CEUs: 1.8

NSTC 011, Payload Safety Review and Analysis (4 Days)

This course is designed as a guide to payload safety review for payload program safety and management personnel. The student will gain an understanding of payload safety as it relates to the overall payload integration process, how the payload safety review process works, and the roles and responsibilities of the various players in the payload safety review process. In addition, the student will be instructed in the hands-on fundamentals of payload hazard analysis, hazard documentation, and presentation of analyses to the Payload Safety Review Panel. The course will include a mock presentation to the Payload Safety Review Panel. Those with only support or supervisory responsibilities in payload safety should attend NSTC course 016, Payload Safety Process and Requirements.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Additional duty safety personnel, and engineers who perform hazard analyses on STS/ISS payloads and who must meet the safety review requirements of NSTS/ISS 13830, NSTS 1700.7, NSTS 1700.7/ISS Addendum, and/or KHB1700.7

CEUs: 2.4

NSTC 016, Payload Safety Process and Requirements (8 Hours)

This course is intended as an overview of the requirements and will merely introduce the payload safety and hazard analysis process. It is intended for those who may be monitoring, supervising, or assisting those who have the responsibility of identifying, controlling, and documenting payload hazards. It will provide an understanding of the relationship between safety and the payload integration process with an orientation to the payload safety review process. It will also describe payload safety requirements (both technical and procedural) and discuss their application throughout the payload safety process - analysis, review, certification, and follow-up to assure implementation. System safety concepts and hazard recognition will be briefly discussed and documentation requirements explained in general terms. Those with primary responsibilities in payload safety should attend NSTC course 011, Payload Safety Review and Analysis.

Target Audience: Program Managers and supervisory personnel, engineering and safety staff, and others who need a general understanding of the payload safety review process and primary technical requirements.

CEUs: .6

NSTC 015, System Safety Special Subjects (2 Days)

This course is presented as a follow up to the System Safety Workshop (NSTC course 008) for those students whose primary duties involve safety or system safety. Management aspects of system safety are discussed along with some additional analytical techniques that are not covered during the 3-day workshop. Subjects discussed include MORT, system safety implementation, and an introduction to software system safety. Students who have attended NSTC course 002 should not attend this course.

Target Audience:

- Supervisors/Managers with safety related management duties
- Any Technical or Non-technical personnel who performs safety analysis or safety management.
- Personnel whose primary duty is system safety

CEUs: 1.2

NSTC 043, System Safety Seminar (2-3 Hours)

This seminar serves to provide an overview of system safety origins, definitions, principles, and practices. It includes a discussion of NASA requirements for both the engineering and management aspects of system safety and answers the question...“What does this mean to me?” Several NASA mishaps are discussed to emphasize and illuminate the system safety principles involved. This course will not serve to prepare attendees to develop or manage system safety programs, only to introduce them to the concepts. This course has most often been given on-site at a Center during Safety Days or some other special occasion, but can be available via the NASA Videoteleconferencing system as well. The instructor-led version of this class can be provided if combined with another course by the same instructor, if there are enough students to merit multiple presentations, or to meet special, urgent needs. Check with the NSTC management staff for determination

Target Audience:

- Attendees at Center Safety Days
- Other audiences who need a quick overview of System Safety

CEUs: None

NSTC 048, System Safety for Managers (2-3 Hours)

This course provides a 2-3 hour overview of system safety for primarily non-technical personnel. This overview includes aspects of both system safety management and engineering. Engineering aspects will include a discussion of three typically used analytical techniques - Failure Modes and Effects Analysis (FMEA), Fault Tree Analysis (FTA), and Probabilistic Risk Assessment (PRA). Course topics include: Why should managers care about system safety; What does it mean to me - Program/Project managers; Why do we do system safety; What is system safety; How do we do system safety; A brief overview of selected system safety analytical techniques; Failure Modes and Effects Analysis; Analytical trees and Fault Tree Analysis; and Probabilistic Risk Assessment. These topics will only be covered to the extent that the students will know what they are and how they are applied - ability to accomplish the technique itself will not be developed in the student.

Target Audience: Non-technical NASA upper and mid-level managers and other audiences who need a quick overview of System Safety

CEUs: None

NSTC 020, Basic System Safety Practice (5 half days, consecutive mornings preferred)

System safety - the complement of reliability engineering - is a doctrine of management supported by analytical engineering techniques and aimed at ensuring that hazards will be identified and that their operating safety risks will be recognized and controlled within acceptable limits. This basic course provides an introductory understanding of the management doctrine. Methods for finding hazards and for assessing their safety risk are shown. Means for establishing safety limits of risk tolerance are illustrated. Methods for dealing with excessive safety risks are shown. The course then presents a family of both inductive and deductive analytical engineering techniques (e.g., Preliminary Hazard Analysis, Failure Modes and Effects Analysis, Fault Tree Analysis, Event Tree Analysis, and Cause-Consequence Analysis). The specific advantages of each technique for application to practical system safety analysis problems are demonstrated. Shortcomings and common abuses in the use of each technique are also identified. Through classroom examples and workshop problems, the participant develops practical working skills (or extends existing skills) in performing basic system safety analyses and at reviewing and critiquing analyses performed by others.

Target Audience: Recommended for Managers and Engineers whose work involves recognizing and managing system safety-related risks.

CEUs: 2.0

NSTC 021, Advanced System Safety Practice (5 half days, consecutive mornings preferred)

Safety risk management, synonymous with system safety, is a doctrine of management practice supported by analytical engineering techniques and aimed at ensuring that safety operating risks will be recognized and controlled within acceptable limits.

This advanced course begins with a brief review of fundamental safety risk management concepts. It provides an in-depth understanding of the management doctrine and presents the two most often used models of that doctrine's successful application within organizational structures. The inductive analytical techniques presented in the basic course (i.e., Preliminary hazard Analysis; Failure Modes and Effects Analysis) are then reviewed, as are methods of applying these techniques and interpreting their results. Attention next turns to in-depth treatment of the logic tree methods that are customarily associated with Probabilistic Risk Assessment (i.e., Fault Tree Analysis, Event Tree Analysis, and Cause-Consequence Analysis). Both quantitative and qualitative applications are dealt with. A number of system diagnostic methods based on the logic tree methods are presented. These diagnostic methods, and uncomplicated sensitivity tests, guide re-deployment of resources within the system to reduce overall safety risk, support cost-benefit trade studies, and find and evaluate system threats posed by "common causes." Advantages and limitations of each technique for application to practical system analysis problems are presented. The links between fault domain and success domain are presented, and the participant is prepared to carry out system analysis "translations" for Fault Tree Analysis to Reliability Block Diagramming to Event Tree Analysis. Through classroom demonstrations and workshop problems, the participant extends skills at performing system safety analyses and at reviewing and critiquing analyses performed by others.

Target Audience: Recommended for Managers and Engineers whose work involves recognizing and managing system safety risks. It is preferred that course attendees are experienced in system safety methodologies or have previously taken the Basic System Safety Course (NSTC Course 020).

CEUs: 2.0

NSTC 022, Reviewing and Perfecting System Safety Analysis

(3 days)

This 3-day course acquaints the participant with cost- and time-effective methods for reviewing system safety analyses of several kinds (specific selection to be made by group served during pre-course discussions). Choices include:

- Preliminary Hazards List
- Preliminary Hazard Analysis
- Failure Modes and Effects Analysis
- Fault Tree Analysis
- Event Tree Analysis
- Cause-Consequence Analysis
- Probabilistic Risk Assessment

Examples of often-found flaws in analysis are presented, and methods of identifying and correcting them are discussed. If desired, example on-site analyses are reviewed and constructively critiqued to ensure adequacy and to prompt improvement, where needed. Topics to be covered include:

- Selecting the Appropriate Analytical Technique
- Gauging Thoroughness of the Analysis
- Identifying and Remediating Flaws in Analysis
- Ensuring Thorough Closeout of Hazards/Hazard Analysis
- Effective Presentation of Analysis Results to Decision Makers

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- System Safety Practitioners
- Managers and Engineers whose work involves planning/managing, conducting, reviewing, and/or approving system safety products.

CEUs: 2.0

NSTC 023, System Safety in Acquisition (3 Days)

The focus of this course is to teach the basics of system safety, the NASA acquisition life cycle, and the relationship of the two. Major subject areas discussed include: system safety requirements for program acquisition, the process of getting system safety requirements on contract, what constitutes an effective system safety program, how a proposed system safety program should be evaluated, and how to determine acceptable levels of staffing. It covers system safety from the planning, contracting, implementing, and evaluation points of view. The course also includes a brief overview and comparison of commonly used system safety analysis types and techniques. Management Oversight and Risk Tree (MORT) concepts for system safety program setup and/or evaluation are discussed.

Target Audience:

- Safety, Reliability, Quality, Maintainability, Health Professionals and Managers.
- Acquisition Managers and Engineers.
- Others who may be involved in the process of writing, approving, implementing, evaluating, or monitoring system safety requirements/performance for acquisition, modification, or operations projects.

CEUs: 1.8

NSTC 025, Software System Safety (4 Days)

This course discusses applications of systems safety concepts, principles, and techniques to the development of software, based primarily on NASA-STD-8719.13. Course topics include an overview of system safety and of software development, NASA requirements for software system safety, setting up a software system safety program, implementing a software system safety program, software hazard analysis including the application of Fault Tree and Failure Modes and Effects Analysis (FMEA) to software, software system safety design techniques, and software system safety assurance techniques.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Those involved in setting up and implementing a software system safety program, software hazard analysis, software system safety design, and assurance.

CEUs: 2.4

Special Programs

NSTC 003, Certified Safety Professional (CSP) Fundamentals Examination Review Course (17 3-Hour Sessions)

The CSP designation is attained through education, accumulation of experience, and examination. The CSP examination process consists of two phases: the fundamentals examination and a specialty examination. Each examination is approximately 5 hours long and they are taken on a computer at any Sylvan learning center near you.

This study course is designed to assist students in preparing for the fundamentals exam once they have met the educational and experience requirements. The course is conducted in seventeen 3-hour segments that are designed to guide and supplement the students' individual study. The course does not teach the test, but rather guides students in learning the material and, as a result, enables them to perform their everyday jobs better as well. The course schedule is keyed to the CSP examination cycle and culminates with a mock exam. Topics include mathematics, basic and applied sciences, program management and evaluation, fire prevention and protection, equipment and facilities, industrial hygiene, environmental aspects, reliability, & system/product safety.

Target Audience: Safety professionals and others desiring to take the Certified Safety Professional (CSP) fundamentals examination or to review basic science, math, and safety.

CEUs: 4.5

NSTC 006, MORT-Based Mishap Investigation (5 Days)

The purpose of this workshop is to provide the knowledge and the analytical tools and techniques to conduct effective and efficient investigations and to report the results of those investigations clearly and concisely. While the basics of mishap investigation and evidence collection are discussed, the focus of the course is on the application of analytical techniques based on the Management Oversight and Risk Tree (MORT) approach to accident investigation. Lecture and theory are reinforced by practical examples and exercises. The information presented is sufficient for investigation of major type A and B mishaps by members of boards of investigation, but is also easily adapted for use by individuals investigating lesser mishaps.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Executive or Supervisory personnel selected for the standing body of board members.
- Anyone interested in, or subject to, being assigned to conduct mishap investigations.

CEUs: 3.0

NSTC 012, Human Factors in Mishap Investigation (3 Days)

This course is specifically focused on the analysis of human error and human factor contributions to mishaps. It will discuss the human factors aspects of mishap causation and also advocate the use of the Management Oversight and Risk Tree (MORT) for an in-depth analysis of mishaps to identify human factors contribution. The course provides an overview of basic human factors and MORT concepts. The human error analysis aspects of MORT will be expanded using concepts from other analytical techniques and a modified MORT diagram will be presented and used during class on scenarios based on actual NASA mishaps.

Target Audience:

- Single investigators.
- Mishap Investigation Board Members.
- Ground Operations Management personnel.
- Rapid Response personnel.
- Facility Managers

CEUs: 1.8

NSTC 014, Management Oversight and Risk Tree (MORT)-Based Mishap Investigation Refresher (2-1/2 Days)

The MORT-Based Mishap Investigation Refresher course is provided to update the student's knowledge of NASA mishap investigation policies, procedures, and requirements. The practical aspects of investigation and reporting - initial response, collecting and interpreting evidence, managing an investigation, writing the report - will be briefly reviewed, and proficiency in the application of commonly used analytical tools, including MORT, will be sharpened through classroom training and student group exercises. Students participating in this course should have previously taken a MORT-Based Mishap Investigation course.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Executive or Supervisory personnel selected for the standing body of board members.
- Anyone interested in, or subject to, being assigned to conduct mishap investigations and/or in need of a refresher of NASA mishap investigation policies, procedures, and requirements.

CEUs: 1.2

NSTC 017, Design for Availability (formerly Design for Reliability) (4 4-hour sessions)

The purpose of this course is to introduce the basic concepts of reliability and maintainability, to provide an overview of availability engineering, and to improve integration of availability analysis into current and future aerospace programs. The benefits include shortening the design and development cycle, reduction in the number of occurrences of time-consuming problems, improved quality, maintenance, safety, increased product life, and improved customer satisfaction. This course will primarily be presented via the NASA Videoteleconferencing system in four, four-hour sessions. Check with the NSTC management staff for delivery of instructor-led classroom sessions on site.

Target Audience: Managers, Engineers, and Technicians who are working in design, project management, test and systems integration, and who require a basic knowledge of availability to assure a dependable product.

CEUs: 1.2

NSTC 018, Space Shuttle Crash Investigation (3-1/2 Days)

This course provides instruction in aviation accident investigation basics and policy, with a focus on investigation of mishaps concerning the Space Shuttle. Topics discussed include: fast response requirements, investigator qualifications, board organization and field techniques. Evidence identification, recovery and protection, medical issues, photography, witness interviewing and site mapping are key areas discussed during sessions on field investigation. Course content also addresses OSHA 1910.1030, Bloodborne Pathogen requirements and NASA requirements on addressing the news media. The course is focused on Space Shuttle crashes and references SSP MIB documents and guidelines, but also contains extensive accident investigation information generally applicable to aviation accidents.

Target Audience:

- Shuttle Mishap Investigation Team Members and Mishap Investigation Board Members.
- Engineers and safety staff in positions to be assigned to Shuttle mishap investigations.
- Ground Operations Management personnel.
- Rapid Response personnel.

CEUs: 2.1

NSTC 019, Aircraft Mishap Investigation (3 Days)

Designed to provide field investigation and management techniques for the individual who must respond to the crash scene and assure the capture of as much evidence as possible in a minimum amount of time. Topics of discussion include pre-mishap preparation, witness interviewing, systems investigation, medical issues, response to the scene, photography, preserving evidence, site mapping, and structural failure mode determinations. Discussion of supporting analytical services and laboratory methods is included for familiarization, but not covered in depth. The course instructor uses practical examples and discussion of actual aircraft mishaps in teaching the do's and don'ts of field investigation.

Target Audience:

- Single investigators.
- Mishap Investigation Board Members.
- Flight operations and maintenance personnel.

CEUs: 1.8

NSTC 024, Mishap Investigation Board Chairperson (1-1/2 Days)

The Mishap Investigation Board Chairperson course is provided to update the student's knowledge of NASA mishap investigation policies, procedures, and requirements as they relate to leading/managing a board. The practical aspects of investigation and reporting - initial response, collecting and interpreting evidence, managing an investigation, writing the report - will be reviewed, and the application of commonly used analytical tools, including MORT, will be discussed. Principles and practices of use to any type of mishap investigation will be included.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals who may be selected to support or advise a mishap investigation.
- Executive or Supervisory personnel selected to lead a NASA or contractor mishap investigation
- Anyone interested in, or subject to, being assigned to lead a mishap investigation

CEUs: 0.6

NSTC 026, Control Team/Crew Resource Management (2-1/2 Days)

This training directly addresses the human factors issues that most often cause problems in team and crew interaction. No one who works in a team or on a crew, especially in high stress activities, is immune to these effects. The Control Team/Crew Resource Management course deals with interpersonal relations; but does not advocate democratic rule or hugging your fellow team members to improve personal relations. Rather, this course provides awareness of the human factors problems that too often result in mishaps and offers recommendations and procedures for eliminating these problems; with an emphasis on safety risk assessment, crew/team coordination, and decision-making in crisis situations. The two versions of this course are applicable both to those in aircrew-type operations and also to personnel operating consoles for hazardous testing or on-orbit mission operations. It is preferable that a “team” experiences the course as a group if possible. One and two-day versions of this course are also available - check with the NSTC to determine which version of the course is most applicable to your operations.

Target Audience:

- Safety Reliability, Quality, and maintainability Professionals.
- Managers, Engineers, and Technicians who work in a team environment and who must coordinate with, and depend on, others to accomplish work objectives and goals.

CEUs: 1.5

NSTC 027, Space Shuttle Crash Investigation Overview (8 Hours)

This course provides a quick overview of space shuttle mishap investigation basics and policy, fast response requirements, investigator qualifications, and board organization. Field investigation techniques - evidence identification, recovery and protection, safety issues, photography, witness interviewing, and site mapping are also briefly reviewed. This course is designed for those who may be called to support a mishap investigation board for space shuttle mishaps in areas such as initial evidence collection and analysis. Those who are members of the shuttle Mishap Investigation Team (MIT) and/or those who may be more directly and extensively involved in the mishap investigation should take NSTC course 018, Space Shuttle Crash Investigation, or one of the other NSTC mishap investigation courses. The course can be tailored to address information generally applicable to space shuttle, aircraft, or expendable launch vehicle mishaps.

Target Audience:

- Potential support personnel for a mishap investigation board
- Aviation/Launch Safety Personnel and First Responders (Fire, Medical, Rescue, etc., personnel).

CEUs: 0.6

NSTC 029, Control Team/Crew Resource Management Seminar (4 Hours)

This training provides a top-level overview of the human factors issues that most often cause problems in team and crew interaction. No one who works in a team or on a crew, especially in high stress activities, is immune to these effects. The course reviews some potential problem areas with interpersonal relations and provides awareness of the human factors problems that too often result in mishaps. This seminar emphasizes safety risk assessment, crew/team coordination, and decision-making in crisis situations. This is a tailored version of the 21/2-day CT/CRM (NSTC 026) designed specifically for special uses like Safety Days, etc. Contact the NSTC staff for further discussion on adapting the course to your specific needs.

Target Audience:

- Safety Reliability, Quality, and maintainability Professionals.
- Managers, Engineers, and Technicians who work in a team environment and who must coordinate with, and depend on, others to accomplish work objectives and goals.

No CEUs available

NSTC 034, Situational Awareness (2-1/2 Days)

Throughout NASA there are many hazardous operations including hazardous test operations that involve operator control over systems in which component failure or operator error can threaten the safety of involved or surrounding personnel. Examples include such varied operations as hazardous testing, propellant transfers, aircraft operations, and on-orbit EVA mission operations. For such operations where extreme danger can result from system failure or operator error, a body of knowledge, called situational awareness, has been developed to promote safe outcomes from potentially hazardous events. Situational awareness involves combining an awareness of what's going on in the operations environment, a knowledge of system failure design criteria, and an understanding of expected outcomes from system failures to avoid hazardous situations and develop safe responses to unsafe conditions that may realistically be expected to arise. This course instructs students in the basic tenets and practices of situational awareness, and how they apply to hazardous operations in NASA in order to promote the best proactive safety techniques in practice. This course may be presented in conjunction with Control Team/Crew Resource Management.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Those involved as test/operations team members in hazardous operations.
- Anyone designing, writing procedures for, or supervising those working in hazardous test or mission operations.

CEUs: 1.5

NSTC 032, Situational Awareness Seminar (4 Hours)

Situational awareness involves combining an awareness of what's going on in the operations environment, a knowledge of system failure design criteria, and an understanding of expected outcomes from system failures to avoid hazardous situations and develop safe responses to unsafe conditions that may realistically be expected to arise. This course provides a top-level overview of the basic tenets and practices of situational awareness, and briefly discusses how they apply to hazardous operations in NASA. This seminar is a tailored version of the 21/2-day Situational Awareness course (NSTC 034) designed specifically for special uses like Safety Days, etc. Contact the NSTC staff for further discussion on adapting the course to your specific needs.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Those involved as test/operations team members in hazardous operations.
- Anyone designing, writing procedures for, or supervising those working in hazardous test or mission operations.

No CEUs available

NSTC Course 035, Management Oversight and Risk Tree (MORT) Principles and Practices (1 Day)

In this course, the use of the Management Oversight and Risk Tree (MORT) analytical technique is discussed in Mishap Investigation. The course includes discussion of the technique and a hands-on exercise on using the technique in a mishap investigation. Also discussed is where MORT fits into the mishap investigation process and use of the output from this technique, in conjunction with other fact-finding and analysis techniques, in determining findings, root causes, and recommendations for improvement. Students who have taken NSTC course 006, MORT-Based Mishap Investigation; or NSTC course 014, MORT-Based Mishap Investigation Refresher, should not take this course except as a refresher on the MORT technique.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Executive or Supervisory personnel selected for the standing body of board members.
- Anyone interested in, or subject to, being assigned to conduct mishap investigations.

CEUs: 0.6

NSTC 049, Root Cause Analysis (3-Days)

This course provides basic training on several root cause analysis techniques that can be used for problem solving or mishap investigation. The student will understand the concept of root causes, how to identify them, and how to formulate corrective actions. Examples and exercises will be provided from NASA and other historical sources. Most of the tools available are derived from the cause and effect relationships and this will be the primary focus in this class. Several software driven tools will also be discussed.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals
- Managers, supervisors, and others tasked with mishap investigation or problem correction.

CEUs: 1.8

NSTC 074, Range Safety Orientation

(1-1/2 Days)

NASA operates and uses ranges to launch, land, and test space vehicles, aeronautical vehicles, and associated technologies. These missions can pose significant hazards and safety risks with respect to life, health, and property. This course is designed to give the NASA senior, program, and project managers an understanding of the Range Safety mission, associated policies and requirements, and NASA roles and responsibilities. It introduces the students to the major ranges and their capabilities, defines and discusses the major elements of Range Safety (flight analysis, flight termination systems, range operations), and briefly addresses associated range safety topics such as ground safety, frequency management, and uninhabited aerial vehicles (UAVs). The course emphasizes the principles of safety risk management to ensure the public and NASA workforce are not subjected to risk of injury greater than their normal day-to-day activities. It is designed to inform the audience of the services offered by the Range Safety organization, present timeframes that allow adequate interface with Range Safety during Program/Project startup and design to minimize potential delays and costs, and recommend ways of making the working relationship with Range Safety most beneficial for the Range User. This course includes a visit to range safety facilities at CCAFS/KSC and will normally only be given at this location. If you wish to discuss presenting the class at your location, please contact the NSTC staff.

Target Audience:

- Senior, program, and project managers
- Safety, Reliability, Quality, and Maintainability Professionals with an interest in range safety activities

CEUs: 1.0

NSTC 400, Certified Quality Engineer (22 4-hour sessions)

The Body of Knowledge and applied technologies taught in this class include, but are not limited to, development and operation of quality control systems, application and analysis of testing and inspection procedures, the ability to use metrology and statistical methods to diagnose and correct improper quality control practices, an understanding of human factors and motivation, facility with quality cost concepts and techniques and the knowledge and ability to develop and administer management information systems and to audit quality systems for deficiency identification and correction.

This study course is designed to assist students in preparing for the Certified Quality Engineer exam once they have met the educational and experience requirements. The course is conducted in twenty-two four-hour segments that are designed to guide and supplement the student's self study. This course does not teach the exam, but rather guides the students in learning the material, and as a result, enables them to perform their everyday jobs better.

Target Audience:

- Quality professionals desiring to take the Certified Quality Engineer exam.
- Those desiring to enhance their knowledge of Quality Engineering.

CEUs: 7.7

NSTC 401, Certified Reliability Engineer (18 4-hour sessions)

The Body of Knowledge and applied technologies taught in this course include, but are not limited to, design review and control; prediction, estimation, and apportionment methodology; failure mode effects and criticality analysis; the planning, operation and analysis of reliability testing and field failures, including mathematical modeling; understanding human factors in reliability; and the ability to develop and administer reliability information systems for failure analysis, design and performance improvement and reliability program management over the entire product life cycle.

This study course is designed to assist students in preparing for the Certified Reliability Engineer exam once they have met the educational and experience requirements. The course is conducted in eighteen 4-hour segments that do not teach the exam, but rather guides the students in learning the material, and as a result, enables them to perform their everyday jobs better.

Target Audience:

- Quality professionals desiring to take the CRE exam.
- Those desiring to enhance their knowledge of Reliability Engineering.

CEUs: 6.3

NSTC 402, Certified Quality Technician (18 4-hour sessions)

This course is designed for those quality technicians who, under professional direction or supervision, analyze and solve quality problems, prepare inspection plans and instruction, select sampling plan applications, prepare procedures, train inspectors, perform audits, analyze quality costs and other quality data and apply fundamental statistical methods for process control.

This study course is designed to assist students in preparing for the Certified Quality Technician exam once they have met the educational and experience requirements. The course is conducted in eighteen 4-hour segments that are designed to guide and supplement the student's self study. This course enables them to perform their everyday jobs better.

Target Audience:

- Quality technicians desiring to take the Certified Quality Technician exam.
- Those desiring to enhance their knowledge of Quality Technician duties and responsibilities.

CEUs: 6.3

NSTC 828, Process Safety Management (PSM) and the Hazard and Operability Analysis (HAZOP) Methodology (2 Days)

This course is designed to provide the student an understanding of the OSHA 1910.119, Process Safety Management requirements for NASA operations and the use of the HAZOP methodology in satisfying those requirements in the analysis of processes and facilities at NASA. Topics to be discussed will include: Background for Process Safety Management; Overview of OSHA 1910.119, Process Safety Management Requirements; HAZOP Process; HAZOP Team Make-up and Selection, Roles, and Responsibilities; Meeting Management; HAZOP Process Tailoring and Node Selection; Use/Tailoring of Guidewords; Hazard Analysis, Safety Risk Assessment, and Hazard Tracking. The course includes both lecture and in-class, group exercises to familiarize students with PSM requirements, the HAZOP methodology, and with HAZOP meeting dynamics.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals responsible for Process Safety Management activities.
- Safety and Facility Engineers who may be asked to perform a HAZOP analysis or be members of a HAZOP team.
- Facility and Process Operators who may be asked to perform a HAZOP analysis or be members of a HAZOP team.

CEUs: 1.2

**NSTC 0850, Basic First Aid
(3 Hours)**

This class is designed to help participants become familiar with how to recognize and care for victims of illness and sudden injuries. Students will be able to recognize an injury or sudden illness. They will learn how to care for muscle, bone and joint injuries, control bleeding and learn general care steps for burns. The course also includes some emergency response techniques to help people feel more confident of their ability to help in an emergency.

Target Audience: Anyone with an interest in or need for accomplishing First Aid

No CEUs are available for this course

**NSTC 0851, Adult CPR
(3 Hours)**

This class is designed to help participants learn how to respond to a breathing or cardiac emergency in an adult. Students will become familiar with signals of breathing emergencies, signals of cardiac emergencies and the subsequent care for suffering victims. The participants will be able to demonstrate how to care for a person who is not breathing, who is choking, or who is in cardiac arrest. The course also covers general “emergency responder” techniques and how best to help in an emergency situation.

Target Audience: Anyone with an interest in or need for accomplishing CPR

No CEUs are available for this course

New Courses for FY2005

The following courses are scheduled for completion of development or adoption by the NSTC in FY 2004 or early FY 2005, and are expected to be available in FY 2005 for regular scheduling.

NSTC Course 075, NASA Range Safety Analysis (4 Days)

One of the primary roles of the Range Safety staff is to perform flight analyses to identify and mitigate public risk associated with range operations. This course is designed to give the student a detailed understanding of range safety analysis. It includes NASA, FAA and DoD requirements for range safety analysis; a discussion of range operations hazards, risk criteria, and risk management processes; an in-depth coverage of the containment and risk management analyses performed for different kinds of vehicles/missions at different ranges; and introduces students to various models and tools used to perform or aid in the analyses. The course concentrates on debris hazards and analyses but includes an overview of toxic and blast analyses. The course culminates with a class exercise that covers the entire analysis process.

Target Audience:

- NASA, FAA and DoD Range Safety Analysts
- Range safety personnel in other disciplines
- Program/project managers and engineers who design potentially hazardous systems to operate on a range
- Personnel who conduct hazardous operations on a range

CEUs: 2.4

NSTC Course 026P, Aircrew Resource Management (2 Days)

This course is a spin-off of the NSTC Crew Resource Management course tailored for NASA aircrew members. It directly addresses the human factors issues that most often cause problems during aircrew interaction. No one who works on a crew, especially in a high stress activity such as flight, is immune to these effects. The Aircrew Resource Management course deals with interpersonal relations by providing awareness of the human factors problems that too often result in mishaps. It offers recommendations and procedures for eliminating these problems; with an emphasis on safety risk assessment, aircrew coordination, and decision-making in crisis situations. It is preferable that a "team" experiences the course as a group if possible. This course is modularized, and individual modules may be taught singly or in combination with other modules on a case-by-case basis - check with the NSTC to determine which modules are most applicable to your situation.

Target Audience:

- NASA Aircrews and associated personnel.

CEUs: up to 1.2 CEUs available depending on the version of the class delivered

NSTC Course 026M, Maintenance Crew Resource Management (2 Days)

This course is a spin-off of the NSTC Crew Resource Management course tailored for NASA aircraft maintenance crewmembers. It directly addresses the human factors issues that most often cause problems during aircraft maintenance and maintenance team interaction. No one who works on any crew or team, especially in high stress activities, is immune to these effects. The Maintenance Crew Resource Management course deals with interpersonal relations by providing awareness of the human factors problems that too often result in mishaps. It offers recommendations and procedures for eliminating these problems; with an emphasis on safety risk assessment, maintenance crew coordination, and decision-making in crisis situations. It is preferable that a “team” experiences the course as a group if possible. This course is modularized, and individual modules may be taught singly or in combination with other modules on a case-by-case basis - check with the NSTC to determine which modules are most applicable to your situation.

Target Audience:

- NASA Aircraft Maintenance Crews associated personnel.

CEUs: up to 1.2 CEUs available depending on the version of the class delivered

NSTC Course 004, Mishap Investigation Orientation and Root Cause Analysis Overview (4-6 Hours)

This course provides a refresher on NASA mishap investigation policies, procedures, and requirements in support of a newly established mishap investigation board or team. Specific requirements of NPR 8621.1 are reviewed and root cause analysis requirements and methodologies are discussed. This course is tailored to the requests of the mishap investigation board/team and/or the Ex Officio representative and may include additional investigation support if requested.

Target Audience:

- Members of NASA mishap investigation boards/teams and those associated with specific NASA mishap investigations.

No CEUs are available for this course

NSTC Course 077, Hazardous Locations (OSHA Standard 1910.307) (2 Days)

The class covers the requirements for electric equipment and wiring in locations which are classified as hazardous depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present and the likelihood that a flammable or combustible concentration or quantity is present. The class specifically addresses:

- The OSHA Requirements for Hazardous Locations found in 1910.307.
- The general requirements for these locations found in section 500 of the National Electrical Code including the Protection Techniques, and Equipment used in Hazardous Locations (T Rating of Equipment).
- The requirements Class 1 Locations (in detail): Wiring Methods and equipment used in Hazardous Classified Locations, Sealing and Drainage, Switches, Circuit Breakers, Motor Controllers, and Fuses, Motors and Generators, Lighting, Utilization Equipment, Flexible Cords, Receptacles and Attachment plugs, Signaling and Communications Systems and Grounding.
- The requirements for Class II Locations (Dust) and briefly the requirements for fibers and flyings
- The requirements for Intrinsically Safe Wiring including color-coding of conductors, control drawings and grounding.
- The requirements of NFPA 496 for purging and pressurized enclosures and NFPA 77 for controlling static electricity.

This course will be presented in-class at your center, and may be combined with NSTC course 0309, Electrical Safety Standards, into 4-1/2 days of training. The course includes lecture and demonstrations.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Electrical Design Engineers, and anyone working around or with electrical systems in hazardous locations.

CEUs: .9 or 1.2 CEUs depending on whether it is presented with NSTC course 0309, or as a stand-alone course.

NSTC Course 078, Space Safety Overview (1 Day)

A large portion of the NASA mission includes the development, launch, and operations of manned and unmanned spacecraft and satellites. One of the primary responsibilities in this mission is to perform analyses to identify and mitigate public and other risk associated with orbital operations. This course is designed to give the student a detailed understanding of orbital safety requirements and analysis. It includes multi-agency requirements for space safety analysis and introduces students to various models and tools used to perform or aid in the analyses. It introduces the students to topics such as: mission planning of on-orbit safety, end-of-life considerations, on-orbit hazards, the orbital environment, conjunction assessments and planning, NASA roles and responsibilities, and interactions with other agencies. It is designed to make the audience aware of such program requirements, and present suggested timeframes that allow adequate consideration of space safety during Program/Project startup and design to minimize potential delays and costs. A field trip to a mission control facility may be included in this course. If so, an additional 1/2 day may be required.

Target Audience:

- Senior, program, and project managers
- Safety, Reliability, Quality, and Maintainability Professionals with an interest in space safety activities

CEUs: .6 or 1.0 (with field trip)

NSTC Course 076, Electrostatic Discharge (ESD) Control (4 hours)

This course is an introductory overview of Electrostatic Discharge Control. It is based largely on the JPL ESD control program, which is an implementation of JPL standard D-1348F "Electrostatic Discharge Control". This standard has been extensively reviewed versus the currently adopted commercial standard, ANSI/EOS/ESD S20.20-1999. In addition, it utilizes best industry practices as represented by the IBM, AT&T, Seagate and Micropolis industry standards. The JPL ESD control program and standard were historically based on NASA standard 8739.7, which has been retired. Topics covered include:

- The motivation for ESD Control
- Electrostatic charge generation
- Effects of electrostatic charge and discharge
- ESD control for people
- Packaging for ESD control
- Managing the ESD control program

This course is offered only on the NASA Videoteleconferencing System to one or multiple centers.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Supervisors, Electrical Design Engineers, and anyone working in circumstances where the buildup of electrostatic charge and/or its discharge may lead to hazards.

No CEUs are available for this course.

**NSTC Course 080, Hazardous Waste and Emergency Response (HAZWOPER)
Incident Commander Refresher Training
(8 hours)**

This course provides basic or refresher training on the OSHA-required HAZWOPR Incident Command System. It is designed to meet OSHA and NASA requirements and renew certifications for those who have previously taken the 40-hour incident commander training.

Training includes:

- Basic concepts of Incident Command for fire, police, and EMS departments
Unified Command, National Integrated Incident Management System (NIIMS)
- Comparison with the Tactical Operations Center/Emergency Operations Center.
- The Basic Incident Command Organization – who belongs where, assignments, how to be a commander, expanding, scaling down, and terminating command
- Incident Command Reports – logs and records, daily events summaries, briefing papers
- Incident Facilities – location, section/division locations within the command group, staging areas, field medical facilities, communications facilities, media locations
- Resources – funding, equipment, personnel
- How to conduct a table top exercise to test the plan

The course will include a short exercise to determine student understanding, and will be tailored to specific needs and requirements of the Center at which it is taught. Close coordination with and input from the emergency preparedness community at the affected Center is a must!

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Those with emergency preparedness/disaster control responsibilities.

CEUs: .6

NSTC Course 081, Hazardous Waste and Emergency Response (HAZWOPER) Incident Commander Training (40 hours)

This course provides training on the OSHA-required HAZWOPR Incident Command System. It is designed to meet OSHA and NASA requirements. Training includes:

- Introduction to Incident Command - National Integrated Incident Management System (NIIMS), concepts of unified command, and basic incident command strategy
- Operating Requirements – organizational structure and common terminology
- Components of the Incident Command System (ICS) – modular organization, communications, command structure, span of control, facilities, and resource management
- Organization and Operations – command, tactical operations, planning, logistics
- Complex Incidents – extending the ICS organization, dividing an incident, considerations
- ICS Forms and Reports – command section, operations section, planning/research section, logistics section
- Site Safety – appointing a safety officer, site safety plan, site safety considerations and control
- Decontamination (where needed for Hazmat or similar exposures) – decontamination officer, decontamination station, emergency decontamination situations
- Site Security – the security officer, the security plan, enforcement
- Media Relations – selecting a media location, questions and comments, release of sensitive information
- Medical Section – rehabilitation point, field hospital or aid station, medical personnel, emergency transportation
- Exercises – setting up and conducting table top or live exercises

The course will include exercises to determine student understanding, and will be tailored to specific needs and requirements of the Center at which it is taught. Close coordination with and input from the emergency preparedness community at the affected Center is a must!

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Those with emergency preparedness/disaster control responsibilities.

CEUs: 3.0

NSTC Course 082, Basic Explosives Safety (2 Days)

The Basic Explosives Safety Course provides initial or refresher training for technicians, supervisors, and managers that work with or in the presence of explosive systems, components, or materials. Topics include: Characteristics & Hazards of Explosives, Explosive Effects, Initiators and Other Explosive Components, Static Electricity & ESD, Hazard Classification Systems, Transporting & Handling Explosives, Storage Principles, Fire Protection and Precautions at Explosives Facilities, Operations Safety, Protective Equipment, Testing Explosive Systems and Components, Hazard Analysis, Material Handling Equipment, and Standing Operating Procedures. In-class Mishap case studies are used in addition to lecture and video to ensure student understanding.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Technicians, supervisors, and managers that work with or in the presence of explosive systems, components, or materials.

CEUs: 1.2

Potential Courses for FY2005

The following courses are scheduled for completion of development or adoption by the NSTC in FY 2005, and may be available in FY 2005 for scheduling on a case-by-case basis.

NSTC Course 079, Space Safety Analysis (2-3 Days)

A large portion of the NASA mission includes the development, launch, and operations of manned and unmanned spacecraft and satellites. This NSTC course will provide an overview of NASA policies and requirements for such vehicles and programs. It is designed to give NASA senior, program, and project managers an understanding of space and orbital safety, the associated policies and requirements, and NASA roles and responsibilities. The course is planned to covers topics the such as:

- Mission Planning for On-orbit Safety (policies and practices) - interference, RFI, MIJI, lasers, system safety and design issues, preliminary and critical reviews, operator inputs, and end-of-life concerns
- Orbital Debris Issues
- Reentry Procedures
- Risk Policy
- Orbital environment/weather
- Conjunction Assessment – tools and common products
- Collision Avoidance (COLA) Tools, Common Products, and Actions
- On-orbit Space Flight Plans
- Crew Management and Human Factors
- Information exchanges with commercial, other nations, and DoD
- Orbital and Launch Safety exchange with FAA/NRO

Target Audience:

- NASA, FAA and DoD Space Safety Analysts
- Other personnel associated with Space Safety
- Program/project managers and engineers who design potentially hazardous systems for space operations
- Personnel who conduct hazardous operations in orbit

CEUs: 1.2 – 1.8

NSTC Course 083, Human Factors/Ergonomics Engineering and Design (2 Days)

This comprehensive course covers the consideration of the human element in system design for both hardware and software. It will address human capabilities and imitations regarding workplace layout, manual material handling, environmental conditions and software user-system interfaces. This course will provide the student with cost-effective and practical solutions, tools and strategies to successfully integrate human factors/ergonomics into system design and development.

Target Audience:

- Safety, Reliability, Quality, and Maintainability Professionals.
- Engineers and others involved in the design and development of hardware and software.

CEUs: 1.2

NSTC Course 084, Hazardous Waste Management (2 Days)

This course is intended for all employees handling and managing hazardous materials and/or waste. The course can be customized and incorporates hazardous waste generator requirements; segregation, labeling; container management; Department of Transportation (DOT) requirements; and waste shipment. The program instructs employees how to perform their duties in compliance with the Environmental Protection Agency (EPA) 40 CFR 262 generator standards and Department of Transportation (DOT) 49 CFR 172/173. Day one of our program provides the DOT training and day two provides the Hazardous Waste Management training.

Target Audience:

- Safety and Industrial Hygiene Professionals.
- Others involved in handling and managing hazardous materials and/or waste.

CEUs: 1.2

NSTC Course 085, Hazardous Waste Management Refresher (1 Day)

This course is intended as refresher training for all employees handling and managing hazardous waste. The course can be customized and incorporates hazardous waste generator requirements; segregation, labeling; container management; Department of Transportation (DOT) requirements; and waste shipment. The program instructs employees how to perform their duties in compliance with the Environmental Protection Agency (EPA) 40 CFR 262 generator standards and Department of Transportation (DOT) 49 CFR 172/173.

Target Audience:

- Safety and Industrial Hygiene Professionals.
- Others involved in handling and managing hazardous materials and/or waste.

CEUs: 1.2